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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

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CONTENTS

COVER: The Albatross IV, the new fishery research vessel for the U.S. Bureau of Commercial Fisheries, was commissioned in December 1962. The vessel will be used as an all-season base for fisheries and physical oceanographic research in the northwest Atlantic, operating out of the port of Woods Hole, Mass.

Page	
1	Present and Future Factors That May Influence Fish Meal Demand, by Clarence F. Winchester
8	Oyster Industry of Chesapeake Bay, South Atlantic, and Gulf of Mexico, by Charles F. Lee and F. Bruce Sanford
Page	
TRENDS AND DEVELOPMENTS:	
Alaska:	
18	Approval of Metlakatla Fish Traps Given for 1963
18	Bureau of Indian Affairs Study Planned on Southeast Salmon Canneries
18	Revised Fishing Regulations Issued
18	Markets for Tanner Crabs Promising
19	Three King Crab Factoryships to Operate to the Westward
19	Crab Studies Shows Progress
Alaska Fisheries Investigations:	
19	Cook Inlet King Crab Fishing Best Ever
19	Age of Red Salmon Smolts Related to Location of Spawning
19	Karluk Red Salmon Races Shown by Fecundity Differences
19	Pink Salmon Egg Mortalities from Over-spawning
California:	
20	Dungeness Crabs in Northern California and Oregon Waters Studied
20	Growth and Life History of Dungeness Crabs Investigated
21	Cans-Shippments for Fishery Products, January-November 1962
Central Pacific Fisheries Investigations:	
22	Clues to Distribution of Young Albacore Tuna Found by Study of Predators' Stomachs
Page	
TRENDS AND DEVELOPMENTS (Contd.):	
Federal Purchases of Fishery Products:	
22	Veterans Administration Requirements for Canned Fish from New Packs
22	Gulf Exploratory Fishery Program:
22	Oregon Participates in International Survey of Tropical Atlantic Halibut:
23	Hearing Held on Proposed Japanese Fishing in Eastern Bering Sea
Industrial Fishery Products:	
23	U. S. Fish Meal, Oil, and Solubles, Production, January 1963
23	New Uses for Fish Oil Explored
24	Use of Fish Oil in Highway Construction Investigated
Inventions:	
24	New Fishing Reel with "Hydraulic" Brake Patented
24	New Plastic Coating for Fish Lures Patented
25	Irradiation Preservation:
25	Multiple-Irradiated Haddock Fillets Evaluated for Quality
26	Marketing
26	Edible Fishery Products Marketing Prospects, Spring 1963
National Aquarium	
26	Plans Emphasize Research and Educational Role for Proposed Aquarium

CONTENTS (CONTINUED)

Page	TRENDS AND DEVELOPMENTS (Contd.):	Page	FOREIGN (Contd.):
27 ..	North Pacific Exploratory Fishery Program:		International (Contd.):
	Abundance of Adult Hake and Efficiency of		Marine Oils:
	Pelagic Trawl to be Investigated	43 ..	Estimated World Production, 1955-63
	Oceanography:		Northwest Atlantic Fisheries Commission:
27 ..	Commercial Fisheries Bureau Establishes	43 ..	Environmental Symposium Planned for 1964
	Oceanographic Instrumentation Program	43 ..	Thirteenth Annual Meeting Scheduled
28 ..	Additional Oceanographic Instrumentation to	44 ..	Mid-1962 Meeting of Commission Scientists
	be Added to Coast Guard Vessels	44 ..	Aging Techniques Workshop Held
28 ..	National Oceanographic Instrumentation Cen-		Trade Fairs:
	ter Established	44 ..	World Fishing Exhibition to be Held in Lon-
	Oregon:		don, England, May 27-31, 1963
29 ..	SCUBA Diving More Extensively Used for		Australia:
	Underwater Observation	44 ..	Fish and Shellfish Landings and Value,
	Oysters:	1960/61 and 1961/62	
30 ..	Chesapeake Bay Oyster Deaths Due to MSX	45 ..	Funds Allocated for Survey of Sperm Whale
	Declined in 1962	45 ..	Resource
	Pollution:		Tuna Survey Off Western Australia
31 ..	Marine Scientist Discusses Pesticides		Brazil:
	Sablefish:	46 ..	Eradication of Piranha in Inland Waters, by
31 ..	Sablefish Tagged in Washington State Recov-		Osmar Fontenele
	ered by Japanese Vessels	51 ..	Canada:
	Shrimp:	Arctic Char from Far North Widely Distributed	
32 ..	United States Shrimp Supply Indicators, Jan-	51 ..	Basic Research on Fish Flavors May Lead to
	uary 1963	51 ..	New Products
	Transportation:	51 ..	British Columbia Shucked Oyster Production,
32 ..	New Rail-Barge Freight Service to S. E. A-	1962	
	laska via Prince Rupert, B. C.	51 ..	Contract Let for New Newfoundland Bait
	United States Fisheries:	52 ..	Service Vessel
33 ..	Commercial Fishery Landings, 1962	52 ..	Fish Protein Concentrate Experiments En-
	U. S. Fishing Vessels:	53 ..	couraging
34 ..	Automated Stern Trawler-Purse Seiner <u>Nar-</u>	53 ..	Fish Sausage Made from Whitefish
	<u>agansett</u> Launched	53 ..	Fishery Research Aided by Underwater Ob-
34 ..	Contract Let for New Pacific Ocean Fishery	54 ..	servations in 1963
	Research Vessel	53 ..	Scientists Report on Fur Seal Investigations
35 ..	Seine Skiffs Carried on Tuna Purse Seiners	54 ..	Groundfish Research Reviewed at 1962 Annu-
	Need Not Be Licensed	55 ..	al Meeting of Scientists
35 ..	Weather Conditions Reported by Radio While	56 ..	Lamprey Population Control in Lake Superior
	on Tuna Fishing Trips	56 ..	New Barge to Serve as Floating Laboratory
36 ..	Documentations Issued and Canceled, Dec-	56 ..	for Biologists
	ember 1962	56 ..	New Directions in Fisheries Research Dis-
	U. S. Foreign Trade:	57 ..	cussed at Annual Meeting
36 ..	Edible Fishery Products, December 1962	57 ..	Oceanographic Information Service Aided by
37 ..	Imports of Canned Tuna in Brine Under	57 ..	Airborne Radiation Thermometer
	Quota	57 ..	Refrigerated Sea Water Used by Fishing Vessels
	Wholesale Prices:	58 ..	Refrigeration Standards for Carriers of
37 ..	Edible Fish and Shellfish, January 1963	58 ..	Fishery Products Proposed
	FOREIGN:	58 ..	New Air Pressure System for Unloading
	International:	58 ..	Salmon Demonstrated
	European Economic Community:	58 ..	Pacific Salmon Tagging and Distribution
39 ..	Fisheries Policy Conference Postponed	58 ..	Studies, 1962
	Fish Meal:	58 ..	Pink Salmon Eggs from British Columbia
39 ..	World Production, November 1962	59 ..	Transplanted in Newfoundland River
39 ..	Fish Meal Exports and Production for Se-	59 ..	Scientists Extend Normal Life Cycle of
	lected Countries, January-October 1962	59 ..	Sockeye Salmon
40 ..	Food and Agriculture Organization:	59 ..	Scallop Landings at Atlantic Ports Set New
	Advisory Committee on Marine Resources	60 ..	Record in 1962
40 ..	Research Meets in Rome	60 ..	Shark Migration Studies Aided by New Brand-
40 ..	World Trade in Fishery Products Reaches	60 ..	ing Technique
	New High in 1961	60 ..	Commercial Catches of Swordfish by Long-
	International Labor Organization:	61 ..	Line in 1962 Very Good
40 ..	Working Conditions in Fishing Industry	61 ..	Revival of British Columbia Whaling Industry
	Reviewed		Aids Biologists
	International Pacific Halibut Commission:		Chile:
41 ..	North Pacific Halibut Regulations for	61 ..	Fishery Trends, December 1962
	1963		Denmark:
42 ..	Conservation Recommendations for Halibut	62 ..	Second Danish-Built Fish Freezing Vessel
	of Eastern Bering Sea		Delivered to U. S. S. R.

Contents continued page III.

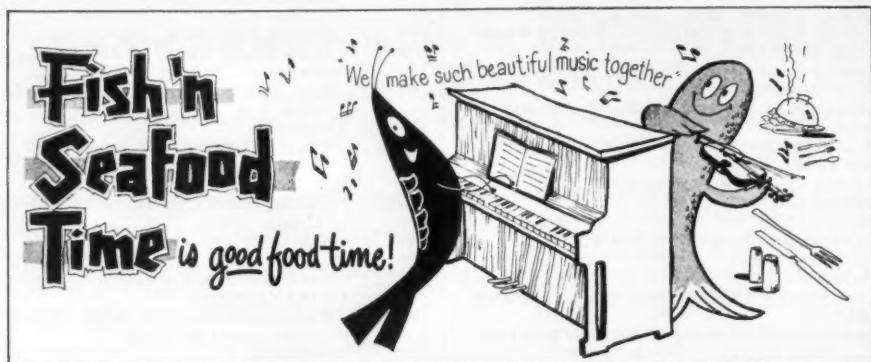
CONTENTS (CONTINUED)

Page	FOREIGN (Contd.):	Page	FOREIGN (Contd.):
	Denmark (Contd.):		Japan (Contd.):
63 ..	Fish Fillets and Blocks and Fishery Industrial Products Exports, January-November 1962	78 ..	Trawler to Explore Waters South of Alaska Peninsula
	El Salvador:	78 ..	Large Stern Trawler Being Built
63 ..	Exports of Edible Fishery Products, 1961	78 ..	Kuwait:
64 ..	Faroe Islands:	78 ..	Fisheries Survey by FAO Expert
64 ..	Exports of Frozen Fish Fillets, January-September 1962	79 ..	Norway:
	France:	79 ..	Fishermen Strike for Higher Subsidies
64 ..	Joint Japanese-French Tuna Bases in South Pacific Approved	79 ..	Fishermen's Strike Settled
64 ..	Mesh Size Regulation for Otter Trawls in Northwest Atlantic Fishery	79 ..	Okinawa:
	Greenland:	79 ..	Import Licenses Eagerly Sought for Japanese Tuna Vessels
65 ..	First Privately-Financed Fish-Processing Firm	79 ..	Pakistan:
	Hong Kong:	79 ..	Shrimp Trawler Fleet Expanded
65 ..	Fish Farming Adds to Food Supply	80 ..	Peru:
	Iceland:	80 ..	Anchovy Vessels and Catch, 1961
67 ..	Fishery Trends, Early January 1963	81 ..	Philippine Republic:
67 ..	Fishing Fleet and Estimated Fishery Landings, 1961-62	81 ..	Fisheries of Biggest Lake Being Studied
67 ..	Fishery Landings by Principal Species, January-August 1962	82 ..	Portugal:
67 ..	Utilization of Fishery Landings, January-August 1962	82 ..	Canned Fish Exports, January-September 1962
67 ..	Fresh Fish Ex-Vessel Prices Established for 1963	82 ..	Canned Fish Pack, January-September 1962
68 ..	Herring Landings Very Good Through December 1962	82 ..	More Bonds Issued to Aid Fishing Industry
	India:	82 ..	Spain:
68 ..	Collaboration Sought for New Fish and Shrimp Project	82 ..	New Fishery Firm Plans Large-Scale Expansion
	Indonesia:	83 ..	Thailand:
68 ..	First Frozen Tuna Exports to United States	83 ..	Industrial Promotion Act of 1962 Includes Benefits for the Fishing Industry
	Japan:	U. S. S. R.	
68 ..	Atlantic Ocean Fishing Conditions and Frozen Tuna Prices	83 ..	Fishing Fleet Operations in Waters off U. S. Coast, 1962
68 ..	Canned Tuna Prices	84 ..	New Crab Factoryship
69 ..	Price Restrictions Abolished on Frozen Tuna for Export to U. S.	84 ..	Soviet Fishery Research Emphasizes the Development of Fishing in the Pacific Ocean
69 ..	Description of Tuna Catch Statistics	85 ..	United Kingdom:
72 ..	Packer's Views on Tuna Problems	85 ..	Fishermen from Southwest England Seek 12-Mile Fisheries Limit
73 ..	Fishing for Tuna in South Pacific Ocean Promising	Venezuela:	
74 ..	Tuna Fishing Forecast for Eastern Pacific, January-February 1963	85 ..	Exports of Edible Fishery Products, 1961
74 ..	Yaizu Fishery Landings, January-November 1962	FEDERAL ACTIONS:	
74 ..	Fish Meal Operations	Department of Agriculture:	
75 ..	Fish Meal Imports	86 ..	Farmers Home Administration:
75 ..	Fisheries Agency's 1963 Budget	86 ..	Fish Farmers and Oyster Planters Now Eligible for Certain Loans
75 ..	Budget for Promotion of Agricultural and Marine Products Exports in 1963	Civil Aeronautics Board:	
75 ..	Sardine Canning Trends, January 1963	86 ..	Need for Uniform Bill of Lading for Air Cargo Shipments Studies
76 ..	Trawler Fishing in Northwest Atlantic Lands First Trip at St. Pierre	Department of Commerce:	
76 ..	Bottomfish Mothership Association Fishing Plans in North Pacific for 1963	86 ..	Area Redevelopment Administration:
76 ..	Bering Sea Bottomfish Landings, 1961-62	86 ..	Grant Approved to Establish Marine Research Center in Oregon
77 ..	Frozen Halibut Exports	Department of Health, Education, and Welfare:	
78 ..	Pearl Essence Import Duty Reduced	Food and Drug Administration:	
78 ..	Trawling Operations in Distant Waters	87 ..	Study of State and Local Food Laws

Contents continued page IV.

CONTENTS (CONTINUED)

Page	FEDERAL ACTIONS (Contd.):	Page	FISHERY INDICATORS:
	Interstate Commerce Commission:	95 ..	Chart 1 - Fishery Landings for Selected States
90 ..	Truck Detention Charges on Trial Basis in Middle Atlantic and New England Territories Approved	96 ..	Chart 2 - Landings for Selected Fisheries
91 ..	Department of Labor:	97 ..	Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products
	Wage and Hour and Public Contracts Division:	98 ..	Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers
	Special Minimum Wage Rates for Handicapped Workers in Seafood Plants to be Changed	98 ..	Chart 5 - Fish Meal and Oil Production - U. S. and Alaska
	Treasury Department:	99 ..	Chart 6 - Canned Packs of Selected Fishery Products
	Internal Revenue:	100 ..	Chart 7 - U. S. Fishery Products Imports
91 ..	Fishermen's Estimated Income Tax		RECENT FISHERY PUBLICATIONS:
92 ..	New Tax Forms Required from U. S. Stockholders in Foreign Firms	101 ..	Fish and Wildlife Service Publications
92 ..	Eighty-Eighth Congress (First Session)	102 ..	Miscellaneous Publications



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PRESENT AND FUTURE FACTORS THAT MAY INFLUENCE FISH MEAL DEMAND

By Clarence F. Winchester*

INTRODUCTION

Our fisheries constitute one of our most important sources of high-quality animal protein concentrate. Without relatively inexpensive sources of such proteins, there is doubt that the poultry and swine industries could have attained their present levels of efficiency.

Of the factors that influence the demand for fish meal, a few that seem particularly worthy of consideration give rise to the following questions: (1) How does the potential demand compare with domestic production plus imports? (2) How does the quantity of imports compare with United States production of fish meal, and what changes have occurred in available supply during the past two decades? (3) What effects are the relatively new poultry by-product meals (including feather meal) having on the demand for fish meal, and how are both classes of products related to the byproducts of the meat-packing industry? (4) What will happen if the fish growth factors are identified and manufactured cheaply? (5) What can we do to increase the buyers' satisfaction with fish meal?

If we can find answers to those questions, we can form a good picture of the future demand for fish meal.

PRODUCTION AND IMPORTATION OF FISH MEAL COMPARED WITH POTENTIAL DEMAND

To determine the relationship between the amount of fish meal presently available in this country and the potential demand, we have assembled pertinent information from a number of sources. The total domestic production plus imports of fish meal and solubles in 1961 give the available supply of those products (table 1).

Table 1 - United States Production and Imports of Fish Meal and Solubles^{1/}, 1961

Product	U. S. Production		Imports		Total (Converted to 60% Protein)
	Actual	As 60% Protein	Actual	As 60% Protein	
Fish meal and scrap .	299,000	299,000	218,000	218,000	517,000
Solubles	110,000	58,000	6,700	3,600	61,600
Total					578,600

^{1/}U. S. Bureau of Commercial Fisheries, 1962.

To compare that quantity of fish meal with the amount of feed consumed by poultry and swine, we have assembled the information given in table 2 on feed intake of those animals.

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^{1/}This paper is based upon a talk presented to the Virginia Fishermen's Association, February 13, 1962, Old Point Comfort, Va.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 669

Table 2 - Feed^{1/} Consumption of Poultry and Swine

Type of Poultry or Swine	Individuals	Feed Per Individual	Feed For Population	
			Million Pounds	Tons
Poultry^{3/}:				
Chickens (except broilers)	369.4	4/100	36,948	18.5
Broilers	1,730.5	5/ 9	15,574	7.8
Turkey (breeders)	3.7	4/144	527	0.3
Turkey, pouls (first 8 weeks) .	81.9	6/ 9	736	0.4
Total . . . . .	.....	.....	53,787	26.9
Swine^{2/}:				
Breeders	8.4	8/2,555	21,421	10.7
Market animals	75.0	8/ 600	45,000	22.5
Total . . . . .	.....	.....	66,421	33.2
Poultry plus swine, total . . . . .	.....	.....	60.0	

^{1/}Air-dry basis.^{2/}Feed per year for breeder, per individual for market poultry and swine.^{3/}United States Department of Agriculture, 1960.^{4/}National Research Council, 1960.^{5/}Reference No. 4, Table 7.^{6/}Reference No. 4, Table 8. By interpolation, small-type female and male pouls weigh respectively 2.5 and 3.1 pounds and have consumed 6.3 and 7.3 pounds of feed by the end of the eighth week; large-type weigh 4.2 and 4.8 and have consumed 8.9 and 10.6 pounds of feed. By representing distribution as 15 percent small-type and 85 percent large, the present mean size of turkeys at slaughter, slightly under 18 pounds, is approximated (United States Department of Agriculture, 1962a).^{7/}United States Department of Agriculture, 1961.^{8/}National Research Council, 1959.

The amount of fish meal and solubles available in 1961 was about 579,000 tons (solubles converted to a 60-percent protein basis). This level of production, though seemingly large, is dwarfed when compared to the feed intake of poultry and swine. One percent of the total feed consumption given in table 2 is shown in figure 1 together with the present level of production of fish meal and solubles plus imports. This figure demonstrates that our production and imports are equal to only about 1 percent of the feed consumed by those animals. A 5-percent level, however, would not be excessive for any of the animals shown in table 2; actually, many broiler rations contain 10 percent of fish meal, or slightly more. The limiting factor is the oil content of the meal because a mixed feed that contains over 1 percent of fish oil can impart a flavor to poultry meat detectable by some individuals. Fish meal that contains 10 percent of oil or less can be used safely at the 10-percent level in a mixed poultry feed. Obviously, the possible consumption of fish meal and solubles is several times greater than the present domestic production plus imports.

IMPORTED FISH MEAL COMPARED WITH DOMESTIC PRODUCTION

Imports accounted for 38 percent of the fish meal and solubles consumed in the United States in 1961, whereas for the years 1960, 1959, and 1958, the percentages were 28, 27, and 25, respectively. It may be concluded that imports are increasing rapidly and that they may soon exceed domestic production. Because this short-time comparison may distort the picture, however, we have represented graphically both the United States production and imports during the past 21 years in figure 2. The figure shows that although both domestic production and imports have increased during the period in question, imports have tended to increase faster than has domestic production. Nevertheless, the increase of imports in comparison with United States production viewed over a two-decade period has not been as rapid as is suggested by the data for the past four years. Although South American production has

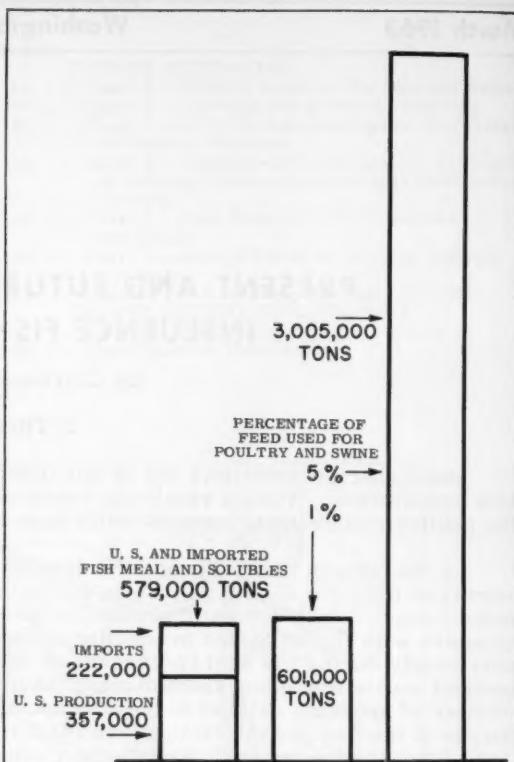


Fig. 1 - Fish meal and solubles available supply compared with possible demand. (Data are from tables 1 and 2.)

undoubtedly influenced recent imports, figure 2 shows that in 1950, and in some prior years, imports represented a considerable share of the total consumption, amounting at times to as much as 19 percent. It would be unwise to use the imports of the past four years as a basis for predicting future imports, yet at the same time we are not justified in extrapolating the data for the past one or two decades.

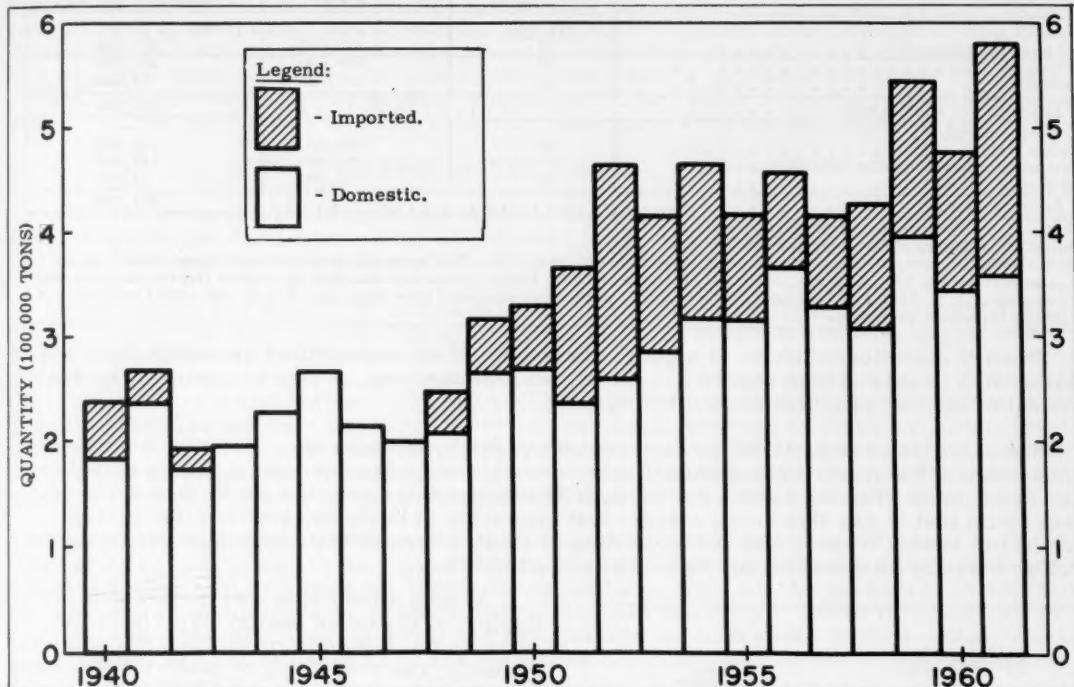


Fig. 2 - Domestic production and imported fish meal and solubles. (Tonnages of solubles converted to represent 60-percent protein. U. S. Bureau of Commercial Fisheries Statistical Digests, 1959 and earlier; and U. S. Supply of Fish Meal and Solubles, 1951-1961 and 1962.)

It appears safe to assume that United States production and imports will both continue to increase, but it is not possible to predict whether domestic production and imports will follow the trends of the past two decades, those of the past few years, or some other trend.

MEAT SCRAP AND POULTRY BYPRODUCTS IN RELATION TO FISH MEAL

The largest source of animal protein concentrate is meat scrap and tankage, by products of the meat packing industry of which roughly $1\frac{1}{2}$ million tons are sold annually. The production of those concentrates about doubled during the past 20 years. The magnitude of meat scrap and tankage production in comparison with other protein concentrates is given in table 3.

Poultry byproducts--feather meal, poultry meat scrap, and blood meal--however, have appeared on the market only within the last decade.

When feather meal first appeared, there was some question as to whether it would prove to be a suitable feed ingredient. Unprocessed feathers are, of course, practically undigestible, and many poultry producers doubted that cooking feathers about half an hour at 35-pound pressure would render them fit for use as feed. Actually, such treatment produces a concentrate that is 70 percent digestible. It has been demonstrated that feather meal protein is well utilized by chicks in proportions up to almost two-thirds of the dietary protein intake when

properly supplemented with lysine, methionine, and tryptophan--amino acids that occur in relatively limited amounts in feather meal (Davis et al 1961).

Table 3 - United States Production of Animal Protein Concentrates

Product	Protein Concentration	Production	
		Actual	Converted to 60% Protein
Meat scrap and tankage ^{1/}	55	1,677,000	1,537,000
Fish meal ^{2/}	60	299,000	299,000
Solubles ^{2/}	32	110,000	58,000
Fish meal and solubles total			357,000
Poultry byproducts ^{3/} :			
Feather meal	85	105,000	149,000
Meat scrap and meal (poultry byproducts meal)	55	152,000	139,000
Blood meal (poultry)	80	10,000	13,000
Poultry byproducts total			301,000

^{1/}United States Department of Agriculture, 1962b.

^{2/}United States Bureau of Commercial Fisheries, 1962.

^{3/}United States Department of Agriculture, 1961. Davis, J. G., et al 1961. The most recent data on proportions of total poultry waste converted to byproducts are, unfortunately, those of 1955. Poultry production data from Agriculture Department were used with data of J. S. Davis (1955 figures). Without doubt, percentages converted have risen since 1955 so that actual production of poultry byproducts exceeds the figures offered by us.

Poultry meat scrap, which is a good source both of the unidentified growth factors and vitamin B₁₂ is held in high regard by animal nutritionists, and, of course, poultry blood meal is equal to similar products from other species.

The monetary return to the poultry processor for byproducts can amount to 0.5 percent of the value of the poultry slaughtered. (Davis et al 1961). Broiler men maintain that there have been times when the return for the byproducts was their only net profit, and some of them claim that it was this small margin that kept them in business when broiler prices slumped in 1961. Thus, it was the marketing of poultry byproducts that helped preserve the broiler industry as a market for fish meal and solubles.

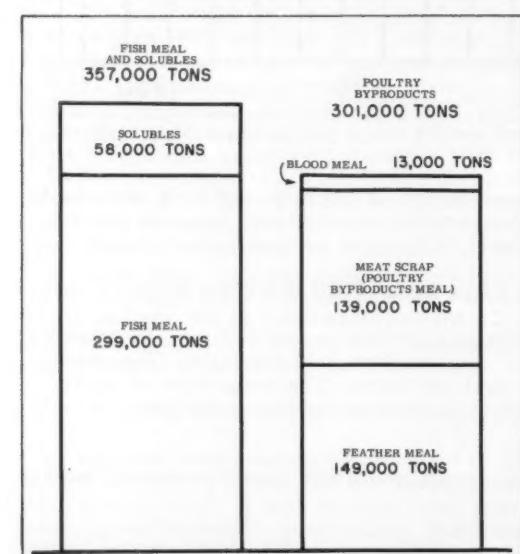


Fig. 3 - United States production of fish meal and solubles, and poultry byproducts. (Quantity modified to represent 60-percent protein for all products. Data are from table 3.)

Figure 3 indicates that the present production of the three poultry byproducts is equal to the domestic production of fish meal. Actually, the production of poultry byproducts probably is greater than the data show in view of the fact that the most recent available data on the proportions of poultry wastes converted to byproducts are those compiled in 1955 (Davis et al 1961). These conversion rates with the most recent poultry production data available (United States Department of Agriculture 1961) were utilized in arriving at the poultry byproducts output levels given in table 3.

How great a share of the market will be taken by poultry byproducts in the future? To get an approximate answer, we have to glance at the history of the poultry byproducts industry. Feather meal was virtually unheard of prior to 1950, but by 1955, 46 percent of the output of poultry feathers was being converted into feather meal; this means that together with those feathers utilized by farmers and dealers, 76 percent actually was utilized. Almost without doubt, the proportion converted to feather meal has increased since

1955. Recovery rate of offal was already 90 percent and of blood 44 percent in 1955, and it is not unlikely that those rates also have increased. It seems reasonable to assume that a large part of all the poultry waste now available is being converted into protein concentrates.

While an increase in poultry production doubtless will result in an increased output of byproducts, it likewise can be expected to increase the amount of fish meal required for poultry feeding. It follows that production of the poultry byproducts in relation to fish reduction products is now fairly stabilized just as the production of protein concentrates from packinghouse wastes has been for many years, and there is no reason to believe that those protein concentrates will offer greater competition to fish meal in the future than they do at present unless price shifts or other economic phenomena alter the situation.

IDENTIFICATION OF THE FISH GROWTH FACTORS

Will the demand for fish meal and solubles decline if the fish growth factors are identified? Perhaps you have heard someone remark: "The minute the fish growth factors are identified, the market for fish byproducts will go to pieces."

Researchers are making an intensive search for the unidentified growth factors of fish meal; recently a number of different groups have reported progress. Mason, Sacks, and Stephenson (1961) report that the growth response of chicks to condensed fish solubles is caused by both organic and inorganic constituents, copper and molybdenum being included in the latter. Runnels and Snyder (1960 and 1962) report the presence of a growth factor in the ash of incinerated chicks. The early literature has been reviewed by those workers. One group (University of Wisconsin News Release, December 27, 1961) has been able to concentrate the factors sufficiently well to enable a ration that contains only one-sixth percent concentrate to be as effective as one that contains fish solubles at the 2-percent level.

Even if the fish growth factors should become available in inexpensive forms, however, there is no reason to expect the market for fish reduction products to disappear; meal and solubles always will be valued for their protein content. What will be necessary to maintain the market will be an increase in sales and public relations effort. It will be necessary to remind buyers that fish meal is one of the best protein concentrates available. Also, it may be necessary to educate users as to the special values possessed by fish meal. They must be made to realize that:

1. Fish meal is made up of proteins of high quality with (a) a favorable distribution of amino acids and (b) a high nutritional availability of those amino acids.
2. Fish meal incorporates high levels of methionine and lysine, amino acids that are valuable in corn-soy and other feed mixtures in which levels of those amino acids are low.
3. Fish meal contains valuable B-complex vitamins.
4. Fish meal contains liberal amounts of phosphorus and calcium plus other needed elements, including essential trace elements.
5. Fish meal helps maintain rapid growth of young swine and poultry despite stress factors.
6. Fish meal, in correctly formulated rations, helps keep hens laying and is believed to assist in maintaining fertility of hatchery eggs.

Just as it will become increasingly necessary for fish meal producers to inform consumers of the values inherent in fish meal, it will also become increasingly important to guard against dissatisfaction on the part of fish meal users. The best way to satisfy the users is to provide a uniform product of the highest quality possible.

MAINTAINING AND INCREASING THE DEMAND FOR FISH MEAL

Fish meal producers in various countries (IAFMM Record of Proceedings 1961) agree that more emphasis must be placed upon quality of the product. However, an improvement in average quality will necessitate industry-wide agreement on a number of points such as minimal and maximal permissible levels of oil and moisture in fish meal, maximal allowable temperatures of scrap during curing, and methods of analysis; and until such agreement is reached, the achievement of uniform quality cannot be expected to materialize.

Manufacturers of mixed feed, while discussing the problem of standardization of fish meal with personnel of the Technical Advisory Unit, have offered what may be an interim, partial solution. The feed producers suggested that it is important to have quality information, in advance, on each shipment of meal. Some stated that if they knew what to expect, they could plan accordingly, and quality of the meal would not then be such a crucial matter. One feed producer offered the following example: "We received a shipment of fish meal that was 20-percent oil, but we had been told of this fact in advance and were able to plan accordingly. We used that batch of meal without delay and everything worked out fine."

Several feed producers spoke of receiving fish meal containing a high percentage of bones ranging up to 2 inches in length and meals containing excessively high levels of oil and moisture, or with a scorched odor. Those men pointed out that they know how to utilize fish meal that falls short of perfection provided they have advance information as to the characteristics of a given shipment.

If uniform trade descriptions could be adopted, they would facilitate use of the product at the feedmill. For instance, the degree to which an unwanted odor is present in meal could be described in a standardized manner according to prior agreement. The presence of large particles in meal and their frequency, as well as percentages of moisture and oil, could also be mentioned. These simple statements of fact would go a long way toward increasing consumer acceptance of fish meals that vary in degree of excellence.

The idea that uniform trade descriptions be adopted was put forth by conscientious businessmen who sincerely believe that the eventual benefits to fish meal producers will far outweigh the immediate disadvantage. Producers of fish meal therefore may wish to give the idea serious consideration with a view to securing industry-wide cooperation to achieve the goal. Merchandising of fish reduction products may require more public relations work and plain salesmanship in the future than it did in the past, and accurate trade descriptions on an industry-wide basis will constitute an excellent starting point toward improved relations with consumers.

SUMMARY

Knowledge of past and present production levels of fish meal, solubles, and other protein concentrates was extrapolated to suggest future trends of the industry. On this basis, it may be concluded that:

1. Potential use of fish meal in this country is much greater than present consumption.
2. Although imports of fish meal have increased rapidly during the past few years in proportion to domestic production, viewed over a period of the past 21 years, both domestic production and imports have in general increased gradually. It would be unwise to extrapolate data from import data during the recent past in order to predict future imports.
3. Production of meat scrap and tankage, which constitute the largest output of animal protein concentrate, has doubled in two decades. Production of poultry byproducts--including feather meal, poultry meat scrap, and blood meal--has grown from nothing 12 years ago to tonnages comparable with the domestic production of fish meal during the past few years. It is impossible for production of protein concentrates of the latter varieties to increase appreciably, unless poultry production also increases, if most of the poultry waste that can be

converted economically to concentrates is already being utilized; and there is good evidence that the major portion is being so converted.

4. Owing to the intrinsic values of fish meal as an animal protein concentrate, there is no reason to expect a rapid decline in its use even if the growth factors should be identified and manufactured cheaply, provided that improved merchandising techniques, more public relations effort, and greater salesmanship are employed.

5. To maintain the demand for fish meal, representatives of the industry should consider adoption of uniform standards of quality. In the meantime, the industry can maintain excellent relations by supplying buyers with accurate information concerning the quality of each shipment. In the face of impending changes, the industry may find that it will be good business to adopt this policy soon.

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CERTAIN CANNED FISHERY PRODUCTS HEATED MAINLY BY CONVECTION

"Convection may be defined as the transfer of heat by currents. A pail of water heats mainly through convection, since water or other liquids tend to expand when they are heated, which decreases the density. The greater density of the colder liquid causes the heated liquid to rise and set up a circulation, thus distributing the heat throughout the mass. Transfer of heat by convection is very much faster than transfer of heat by conduction. Wet-pack shrimp, oysters, and "ready-to-serve" soups and chowders are products heated mainly by convection. Products in which convection currents are sluggish or absent due to a semisolid nature of the product, such as salmon, require much longer processing at a given temperature than products in brine or liquid in which convection currents are unhindered."

--*Principles and Methods in the Canning of Fishery Products*, Research Report No. 7 (page 24), U. S. Fish and Wildlife Service.

OYSTER INDUSTRY OF CHESAPEAKE BAY, SOUTH ATLANTIC, AND GULF OF MEXICO

By Charles F. Lee* and F. Bruce Sanford**

The Eastern oyster, known to biologists as *Crassostrea virginica*, once grew and thrived all the way from Maine to Texas. Huge piles of opened shells are evidence that oysters were plentiful in the area now known as New England and were relished by the Indians long before the Pilgrims landed.

Growing Area	Production of Raw Shucked Meats of Eastern Oysters					
	1960		1958		1950	
	1,000 Lbs.	Percent of Total	1,000 Lbs.	Percent of Total	1,000 Lbs.	Percent of Total
New England States (R.I., Conn., Mass.)	500	1.0	276	0.5	4,727	6.9
Middle Atlantic (N.Y., N.J., Del.)	1,154	2.4	4,296	7.8	18,170	26.7
Chesapeake Bay: (Md., Va.)	27,111	55.3	37,530	68.0	29,953	43.9
South Atlantic (N.C., S.C., Ga.)	4,119	8.4	2,651	4.8	3,034	4.5
Gulf (West Fla., Ala., Miss., La., Tex.)	16,098	32.9	10,408	18.9	12,292	18.0
Total	48,982	100	55,161	100	68,176	100

Reference: Fishery Statistics of the United States for 1950, 1958, and 1960. E. A. Power, Chief, Branch of Statistics, Bureau of Commercial Fisheries.

As recently as 1950, Rhode Island and Connecticut produced almost 5 million pounds of oyster meats, amounting to 7 percent of the total production (see table). For that same year the Middle Atlantic States of New York, New Jersey, and Delaware produced over 18 million pounds of shucked oysters, equal to 27 percent of the total, compared to 5 percent for the South Atlantic and 18 percent for the Gulf States. Chesapeake Bay produced 44 percent.

CHANGES

During the past decade, the fortunes of many of the oyster-producing areas have changed dramatically, and unfortunately, for the worse. Changing biological and ecological factors

have usually combined to effect this widespread reduction in the oyster harvest. In some regions the growth of large waterfront



Fig. 1 - Most oysters are harvested with medium-size power dredge boats, though in Maryland, because of a State law, dredgers must still rely on sail power. Some dredge boats are very neat and trim.

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**Chemist-in-Charge, Branch of Reports, Seattle, Wash.



Fig. 2 - Large plants employ larger dredge boats.

U. S. Bureau of Commercial Fisheries.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 670

communities and industries has overrun formerly valuable oyster-growing areas. Of greater importance are the multitude of biological enemies. Starfish, drills, mudworms, boring sponge, large predators such as drumfish and crabs, and, worst of all, several microscopic organisms have weakened or killed uncounted millions of oysters of all ages.



Fig. 3 - This plant has a dock conveyor system by means of which eight large dredge boats can be unloaded at one time.



Fig. 5 - If a shellstock washer is used, much of the mud and debris can be removed before the shellstock is carried into the plant.



Fig. 4 - Shown in the foreground is a rotary washer for the shellstock.



Fig. 6 - Portable conveyors are often used to move shellstock from boat to storage area.

Adverse ecological conditions have eliminated millions more. Hurricanes and lesser coastal storms, for example, have covered and destroyed hundreds of acres of marketable oysters, and less dramatic but almost as extensive damage especially in the Southern States, has resulted when the runoff following heavy rains has made the waters over the oyster beds

too fresh for oyster survival. Silting is another hazard, sometimes resulting from heavy runoff, and in some areas as a side effect of dredging operations.

Thus, the industry, particularly that of the Central and North Atlantic Regions, has suffered a continued decline in the harvest of oysters and the production of shucked oysters. In 1958, the last year for which complete records are available, New England produced only 0.5 percent and the Middle Atlantic 8 percent of the total quantity of shucked oysters. The most recent data available, for 1960, show that the production in the Middle Atlantic states was only 2.4 percent. In most areas, surviving oysters are so sparsely distributed that it is no longer economical to attempt their harvest. Indirectly, this may result in the development of a resistant stock and recovery of the oyster fishery.



Fig. 7 - This plant uses a hand truck and wire baskets to carry shellstock from storage room to shuckers' benches.



Fig. 8 - Floors in storage areas or plants are made of concrete.



Fig. 9 - This plant uses a tractor to move shellstock into chutes feeding to the shucking room.



Fig. 10 - This filling hopper and the V-shaped "cars," which ride an endless track, make a conveyor system that was especially designed for maximum flexibility in moving the shellstock to the shuckers.

These drastic losses in production in the North have made the Chesapeake Bay, and more especially the South Atlantic and Gulf the principal source of supply of our "Eastern" oyster. As can be seen in the table, the oyster production for 1960 for those regions not only represents a greater proportion of the remaining production but the actual level of production has been raised to new high levels. The percentage of the total production coming from those two regions increased from 24 percent in 1958 to an unprecedented 41 percent in 1960.



Fig. 11 - The small steel anvil in the shucking block is used to crack the thin edge or "bill" of the oyster.

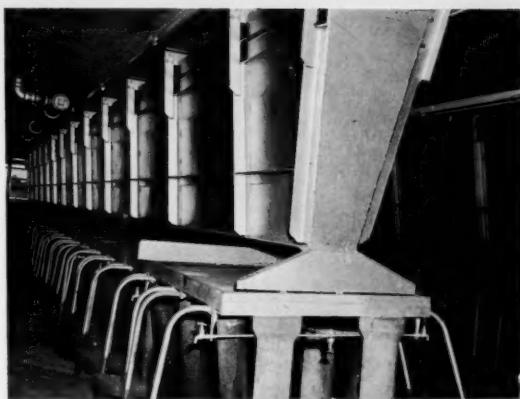


Fig. 12 - These shucking benches have overhead bins. Large rubber pipes under the bench carry empty shell to a basement conveyor system.



Fig. 13 - Science has yet to perfect a machine for opening raw oysters. The first step in shucking an oyster is to force the knife between the edges of the shell. The upper muscle is then cut loose.



Fig. 14 - The upper shell now is wedged off by a twist of the knife.



Fig. 15 - Another stroke of the knife cuts the muscle loose from the bottom shell, and the shucker then flips the meat into the shucking pot. In most Chesapeake Bay plants, each shucker has 2 or 3 pots for different sizes, and he does all grading for size.



Fig. 16 - In some areas, shell oysters are brought to the shucking plants in bags. Shuckers may be paid by the number of bags shucked rather than by the volume of shucked oysters--hence the compartmented benches.



Fig. 17 - Pail of shucked oysters is taken to the delivery window of the washing-packing room.



Fig. 19 - Chesapeake Bay plants use blowers to clean the shucked oysters. In this plant, blowers are mounted high enough so that they discharge through the open gate-valve directly onto the packing skimmer. Note the slotted collar to retain oysters during the overflow rinse period.



Fig. 21 - Oysters are bailed from the low-mounted blower tanks in this installation. Tanks may hold 20 to 40 gallons of oysters.



Fig. 18 - In many Gulf Coast plants, oysters are washed, 1 or 2 gallons at a time, in a dishpan with flowing water. The washing period is usually about 3 to 4 minutes.



Fig. 20 - Shown here is another high-mounted blower installation. These two medium-size tanks would handle oysters from 20 to 30 shuckers. Small plants employing up to 15 shuckers often have only one blower.



Fig. 22 - One worker empties the tank while the "skimmer man" fills a 5-gallon measure. Oysters are held in the 5-gallon cans (foreground) until they can be packed into smaller units. Often this repacking will be done in a large central plant.

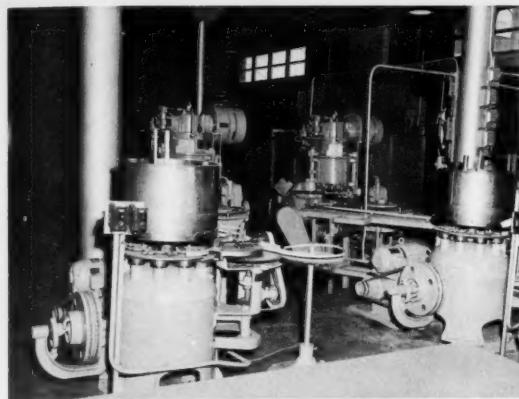


Fig. 23 - These are automatic filling machines for pint, 12-, or 10-ounce cans. Ten gallons or more of oysters are emptied into the top tank, and they finish up in hermetically-sealed small units.



Fig. 25 - A mechanically vibrated packing skimmer may also be used.



Fig. 27 - Cans are thoroughly iced before being shipped. A number of plants now have their own flake-ice machines to assure a plentiful supply.



Fig. 24 - This plant uses a power-driven vibrating delivery skimmer and weighs the drained oysters instead of measuring the volume.



Fig. 26 - Plant operators ship their cans of oysters in wooden barrels or in fiber boxes. Gallons or retail-size units of a pint or less are the sizes of containers used both in the South and the East.



Fig. 28 - Many plants have large cold rooms for holding shucked oysters until they are shipped.



Fig. 29 - Some oysters are frozen in small cans. In this method of packing, the weight of oysters in each can must be checked on the scales because cans cannot be completely filled, owing to the expansion of the product when frozen.



Fig. 31 - Space is left between units to permit circulation of the freezing air blast.

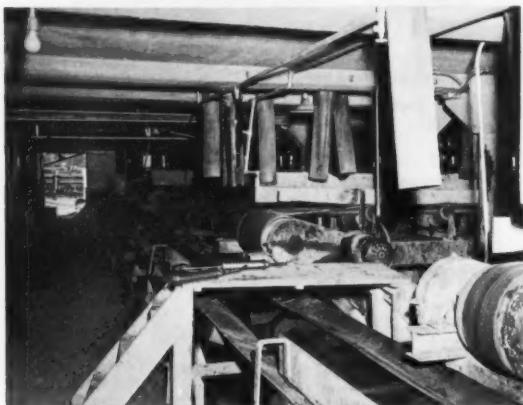


Fig. 33 - This plant uses a complex system of conveyors to collect the shell discharged through the pipes from the benches and to move the shell to the storage piles.



Fig. 30 - The sealed cans are packed into metal trays for freezing.



Fig. 32 - Large volumes of empty shell accumulate from the shucking operation. In some plants, the shell is moved by wheelbarrow to the shell pile.



Fig. 34 - During the summer, the huge piles of shell accumulated during the "R" months are put back onto the seed beds to serve as "culch" for the young oyster spat. The crane is used to move the shell to a barge.



Fig. 35 - This self-powered conveyor-loader is also used to load shell into barges or trucks.



Fig. 37 - In some states, the conservation department buys shell to "plant" on and improve public growing areas. Here the *Uranus*, Mississippi Marine Conservation Commission Patrol Vessel, is tied alongside a barge load of shell intended for this purpose.



Fig. 39 - Canning oysters is an important industry in the South. Canneries start operations in the Spring when the yield per bushel of oysters is at its seasonal high. The shellstock is washed to keep mud and debris from the cookers.



Fig. 36 - The barge shown here is used to carry the shell to the seed-growing areas.



Fig. 38 - After the oyster "spat" (pin-head-size oysters) set on the clean shell, they are left to grow a year. They then are usually taken up during the summer and moved to areas where conditions are better for fast growth. This small barge load of 1-year-old or "seed" oysters is on its way to the growing beds.



Fig. 40 - One oyster cannery uses vertical autoclaves, filled from overhead conveyors with the raw shellstock, for cooking the oysters.

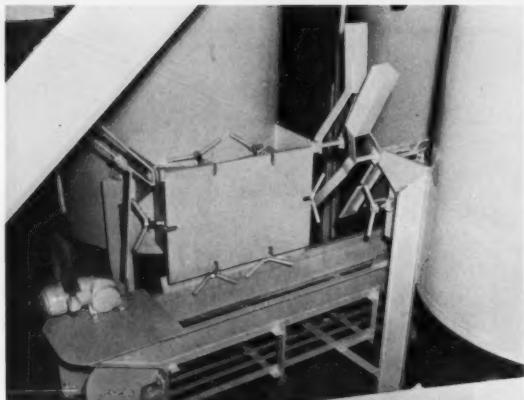


Fig. 41 - When the cook is completed, the bottom gate is unclamped, and the shellstock is discharged to a second conveyor. Conveyor belts have been removed during off-season painting and maintenance operations.



Fig. 43 - Metal-slot cars hold the shellstock during steaming. On the left is a specially designed shellstock washer with mesh belt removed.



Fig. 45 - The shell passes through to a discharge conveyor (belt removed) and is carried out to the shell pile.

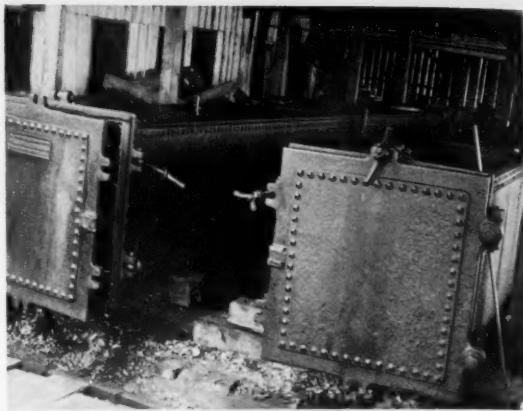


Fig. 42 - Most of the oyster canneries use low-pressure horizontal retorts for steaming the shell oysters.

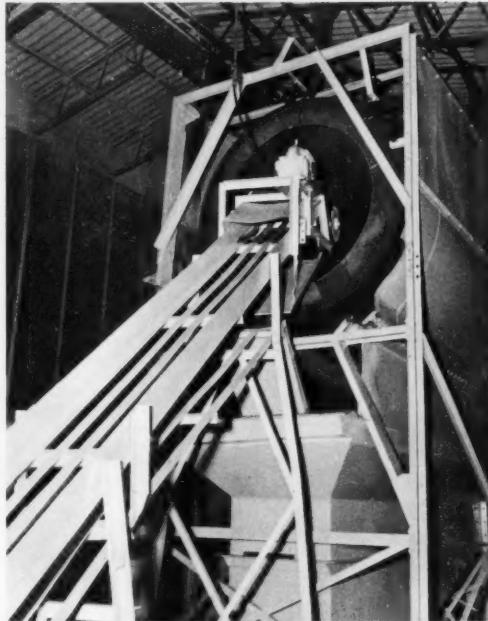


Fig. 44 - Almost all canneries now have replaced hand labor with some modification of the mechanical shucker shown here. The steamed shellstock is tumbled in this rotating cylinder. The meats are shaken loose and fall through the slots into the tank below.

In addition to producing fresh-shucked oysters, the Southern States are the only producers of canned Eastern oysters. In 1958, 29 plants processed nearly 270,000 standard cases valued at \$3.7 million, down 46 percent in quantity and 47 percent in value compared to the pack of 1950, but still economically important.

VAST ENTERPRISE

Statistics, however, cannot convey a real picture of the vast enterprise required to bring oysters to the consumer. It is an industry of tremendous variety and of human as well as pictorial interest. Oyster plants range in size from a small family operation in the marshland with 3 to 4 shuckers to huge city plants employing a hundred times that many. Equipment ranges from the shovel and wheelbarrow for moving the live oysters in the shell (or shellstock as it is commonly known to the industry) and empty shell, to completely mechanized handling from boat to shucker and shucker to shell pile. Washing equipment may be one stainless steel dishpan or eight large blowers, each of which may clean 40 gallons of oysters at a time. Yet that one vital human link--the shucker--still holds his own.

The series of photographs gives a cross-section of the fishery. Typical Gulf Coast plants are included as well as several plants in the Chesapeake Bay region.

Note: Acknowledgements: The authors gratefully acknowledge the cooperation of the oyster industry, the following members of which contributed directly to the production of the report: Joseph Jurisich, Popich and Jurisich, New Orleans, La; Chester Delacruz, Southern Shell Fish Company, Inc., Biloxi, Miss.; Mississippi Marine Conservation Commission, Biloxi, Miss.; C. A. King, Ocean Lake and River Fish Company, Beaufort, S. C.; H. C. Travers, Shellmore Oyster Company, McClellanville, S. C.; William Ballard, Ballard Fish and Oyster Company, Inc., Norfolk, Va; Frank Miles, J. H. Miles and Company, Inc., Norfolk, Va.; D. P. Elliott, G. T. Elliott, Inc., Hampton, Va.; The Hogg Brothers, Hogg's Oyster Company, Gloucester Point, Va.; Cranston Morgan and Raymond Morgan, W. F. Morgan and Sons, Inc., Weems, Va.; Harmon Treakle, Irvington Packing Company, Inc., White Stone, Va.



Fig. 46 - Canneries also replant the empty shell on seed beds. Note the portable gasoline-powered pump on the shell barge. This pump throws a powerful stream of water, which washes the shells overboard, and distributes them on the beds. In this manner, the cycle of operations necessary to bring oysters to the consumer begins once again.



OYSTER GRABS

This is an implement used for taking oysters on the tidal flats of South Carolina and Georgia. It consists of a pair of jaws with a fulcrum close to the terminal end and is operated like a pair of scissors.



Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.



TRENDS AND DEVELOPMENTS

Alaska

APPROVAL OF METLAKATLA FISH TRAPS GIVEN FOR 1963:

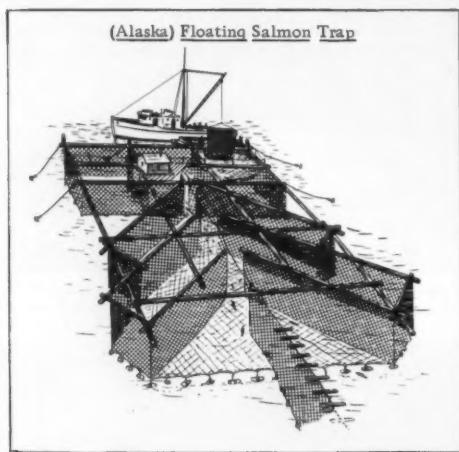
The Secretary of the Interior has announced that the Alaska Indian community of Metlakatla will continue the use of fish traps for salmon during the 1963 season. The Metlakatlans have been allowed to fish with traps since 1915 under Secretarial regulations. The Supreme Court ruled in 1962 that the Alaska law prohibiting fish traps in the interest of conservation does not apply to Annette Island where Metlakatla is located. The Secretary said it was desirable to delay changing the

regulations in Alaska has been approved by the Bureau of Indian Affairs. The study is to be made by the Battelle Memorial Institute of Columbus, Ohio, the Alaska congressional delegation stated. The study will cover the villages of Angoon, Kake, Klawock, Hydaburg and Metlakatla.

* * * * *

REVISED FISHING REGULATIONS ISSUED:

Changes in major commercial fishing regulations by the Alaska Department of Fish and Game became effective on February 3, 1963. Changes of interest provided for by



1915 regulations to bring them into harmony with state law until suitable alternatives to the use of traps have been developed. This will permit the Metlakatla Indians to maintain the level of fish production upon which their salmon cannery depends. The cannery is the economic mainstay of the community.

* * * * *

BUREAU OF INDIAN AFFAIRS STUDY PLANNED ON SOUTHEAST SALMON CANNERRIES:

A \$44,000 study to find additional uses for five native-owned and operated salmon can-



Alaska King Crab
(Paralithodes camtschatica)

the regulations were: (1) the use of monofilament purse seine web for salmon is prohibited, (2) the use of purse seines and leads to form traps for taking salmon is prohibited, (3) diving gear may be used to take king crab, (4) minimum size of king crab was increased from $6\frac{1}{2}$ inches to 7 inches in the Kodiak area, and (5) the prohibition on the herring reduction fishery in the southeastern area was rescinded.

* * * * *

MARKETS FOR TANNER CRABS PROMISING:

Representatives of a California enterprise attempting to utilize Alaska tanner crab resources visited the Bureau's Exploratory Fishing and Gear Research Base at Juneau to review available knowledge on the abundance of that species. They stated that experimental marketing in the San Francisco area has

resulted in enthusiastic response by local brokers.

* * * * *

THREE KING CRAB FACTORYSHIPS TO OPERATE TO THE WESTWARD:

Three king crab factoryships will operate with catcher boats this season in the Adak area of the Aleutian Islands. A smaller factoryship will operate in the Kodiak area. All are associated with an Alaska fishing company. One of the larger factoryships can process 8,000 crabs a day, the other 4,000. The group was expected to pack about \$1.5 million worth of crab in about four months.

* * * * *

CRAB STUDIES SHOWS PROGRESS:

Analyses of all samples from the first block of king crab meat of the series of "drip" studies were completed in January at the Bureau's Ketchikan Technological Laboratory. The percent of nitrogen in a low ionic strength extract of the combined meat and drip showed no apparent regression on percent of drip. This suggests that the increase in nitrogen content with increased drip previously reported was probably a solubility effect, i.e., the more drip there is the more nitrogen is leached out.



Alaska Fisheries Investigations

COOK INLET

KING CRAB FISHING BEST EVER:

According to a shellfish biologist of the Alaska Department of Fish and Game, Cook Inlet king crab fishermen had better fishing in 1962 than any previous year on record. The total catch for the Inlet that year was 6,705,000 pounds. The crabs averaged 8.9 pounds each. At present there are three major areas of Cook Inlet where the crab are caught. They are Kamishak Bay on the west side of the Inlet, which produced 4,163,000 pounds, Kachemak Bay on the east side of the Inlet, which produced 1,958,000 pounds, and the new crab fishing area off the tip of the Kenai Peninsula where 584,000 pounds of crab were caught. Kamishak Bay has produced the greatest number of crab recently. In past years the entire catch for the district came from Kachemak Bay.

* * * * *

AGE OF RED SALMON SMOLTS RELATED TO LOCATION OF SPAWNING:

Bristol Bay red salmon studies are showing that location of spawning grounds within the large Naknek System may determine how long the fry feed in Naknek Lake before departing for the ocean. Scale samples collected in 1962 from the spawning areas of the Naknek System were recently read for age. Indications are that a majority of the young fish from the upper lakes (Coville and Grosvenor) remain three years in fresh water, whereas young fish from tributaries emptying directly into Naknek Lake spend two years in the lake. Netting in the interconnecting streams has shown that fry of the year migrate from the upper lakes toward the end of the growing season and accumulate in Iliuk Arm or South Arm of Naknek Lake. There they remain for an additional growing season subject to fresh-water mortalities before migrating to sea as smolts.

* * * * *

KARLUK RED SALMON RACES SHOWN BY FECUNDITY DIFFERENCES:

Studies of the fecundity of female red salmon on spawning in Karluk Lake tributaries show significant differences between spring and fall run salmon in the same stream. Significant differences in fecundity were also shown between spring run salmon in the different tributaries to Karluk Lake. Those findings lend support to the theory that different subpopulations exist within the Karluk System. These will have to be considered in any comprehensive management program for maximum sustained yield.

* * * * *

PINK SALMON EGG MORTALITIES FROM OVERSPAWNING:

Preserved eggs from the October 1962 sampling of the pink salmon spawning riffles at Olsen Bay in Prince William Sound have been counted and those from the special study area show a heavy mortality largely due to the late spawners disturbing eggs from the early spawners. From the creek water temperatures, it was determined that all pink salmon eggs deposited prior to July 28 should have been in the sac fry stage in October. There were over 900 eggs per square meter on July 28, but only one-tenth as many fry per square meter in the October samples. The exceptionally heavy spawning escapement in 1962 provided a good opportunity to measure the effects of overspawning.



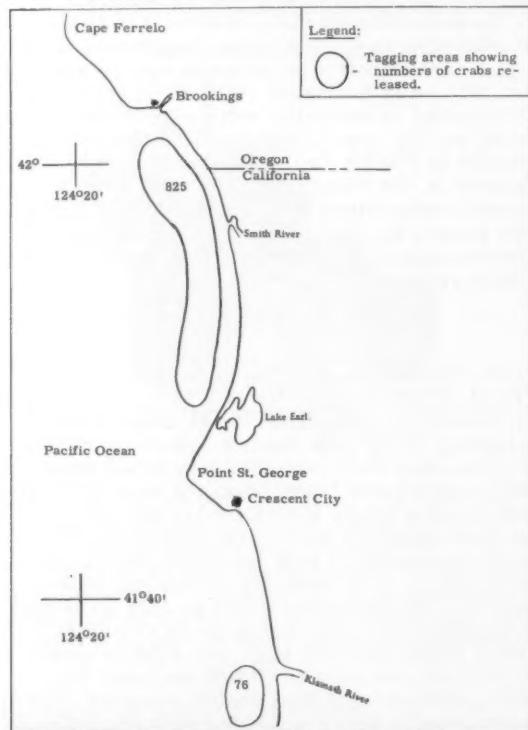
California

Dungeness Crabs in Northern California and Oregon Waters Studied:

M/V "N. B. Scofield" Cruise 62-S-8 (November 19-December 14, 1962): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in the coastal waters off California

Crabs Caught by the <u>N. B. Scofield</u> on Cruise 62-S-8					
Crab Groups	Number of Crabs	Range, Shoulder Width		Average Shoulder Width	
		Mm.	In.	Mm.	In.
Juveniles	43	15-52	0.6-2.0	23	0.9
Sublegal males	1,646	77-158	3.0-6.2	136	5.4
Gravid females	303	117-164	4.6-6.5	145	5.7
Nongravid females	314	99-167	3.9-6.6	130	5.1
Legal males	913	158-208	6.2-8.2	171	6.7

between Cape Ferrelo, Oreg., and the Klamath River, Calif., were: (1) to tag legal male crabs for population and migration studies in cooperation with the Oregon Fish Commission,



(2) to determine crab sizes, sex ratios, and condition during tagging operations, and (3) to survey the northern California crab stocks to determine abundance, sizes, sex ratios, and condition prior to the beginning of the 1962/63 fishing season.

Tagging operations received priority and the survey portion of the original cruise plan was abandoned due to bad weather.

During 11 operational days, a total of 540 sets of commercial 40-inch diameter traps were made in depths of 10 to 40 fathoms. Traps were grouped in strings of 10 at 20 locations and in strings of 20 at 17 sites.

Legal male crabs (6.25 inches shoulder width or 7 inches in greatest width) were marked with neon-red Peterson discs at the lateral margin of the carapace. During the cruise, 901 crabs were tagged and released. In the area between Brookings, Ore., and Lake Earl, Calif., 825 crabs were released in 10 to 17 fathoms. Seventy-five crabs were released in 13 fathoms and one in 22 fathoms off the Klamath River. The goal of 2,000 tagged crabs was not reached due to the scarcity of crabs. Several tagged crabs were recovered by commercial fishermen before completing the cruise.

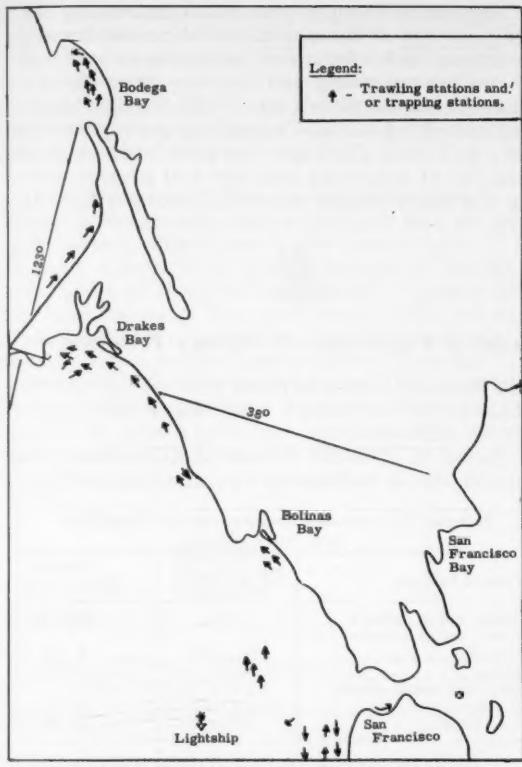
All crabs captured were in good condition. Only 15 (1.64 percent) of 913 legal male crabs had soft shells. The 303 gravid female crabs were carrying reddish-orange egg masses, a color characteristic of early development.

* * * * *

Growth and Life History of Dungeness Crabs Investigated:

M/V "Nautilus" Cruise 62-N-2g-Crab (July 16-20, 1962), 2h (August 13-17), 2i (September 10-14), 21 (December 10-14): The second series of cruises by the California Department of Fish and Game research vessel Nautilus in the coastal waters off central California from Bodega Bay to San Francisco was completed on December 14, 1962. The objectives of the cruises were: (1) to collect dungeness (market) crabs (Cancer magister) for growth studies by using traps and trawl, and (2) to study other aspects of the life history of market crabs.

Collections were made at selected stations from Bodega Head to San Francisco using a 10-foot beam trawl with 1-inch mesh net,



Cruises 62-N-2g, h, i, and 1-Crab by research vessel Nautilus, showing location of trawl and trap stations.

commercial-type crab traps, and 1-inch mesh crab traps. The crab traps were baited with squid and rockfish and fished overnight. Beam trawling was done at each station. Each tow lasted about 20 minutes and covered three-quarters of a mile. Exploratory beam trawling was accomplished at stations where traps were not set.

The captured crabs were calculated to be 18-20 months old (from time of hatching) and were in their 9th, 10th, and 11th instars. The maximum size attained by 20-month-old crabs is estimated as 133 millimeters (5.2 inches).

Growth of males and females was equal until July when the males began to outgrow the females. This growth differential was very obvious in September.

Maturity studies were conducted to determine the age at maturity. Females 81 to 140 millimeters (3.2-5.5 inches) were examined in August and September for ovary changes

and the presence of sperm. All females larger than 112 millimeters (4.4 inches) had ovaries that were developing color, indicating incipient spawning. Females smaller than 109 millimeters (4.3 inches) did not show color changes. Spermathecal examinations revealed that females smaller than 100 millimeters (3.9 inches) had not been fertilized, but 99 percent of the females larger than 108 millimeters (4.3 inches) had sperm in the spermatheca. From the September sample, it was determined that 77 percent of the females were 109 millimeters and less in shoulder width. From this sampling, it was concluded that maturation of developing eggs was occurring in only 23 percent of the female crabs in the fall of their second year of life, but 76 percent were fertilized in their second year.



Cans--Shipments for Fishery Products, January-November 1962

The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-November 1962 was 6.1 percent above that used during the same period in 1961. Prior to 1962, the figures covered only tinplate cans, but beginning with January 1962 aluminum cans are included. Use of aluminum cans for packing fishery products is small.



A total of 2,845,030 base boxes of steel (tinplate) and aluminum were used in the manufacture of cans shipped to fishery plants during the first 11 months of 1962, whereas in the same period of 1961 (when only tinplate was reported) 2,680,951 base boxes of steel were consumed. The increase was due mainly to larger canned packs of Maine sardines, shrimp, salmon, and tuna during 1962.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. The 1962 data are derived by use of the factor 21.8 base boxes per short ton of steel.



Central Pacific Fisheries Investigations

CLUES TO DISTRIBUTION OF YOUNG ALBACORE TUNA FOUND BY STUDY OF PREDATORS' STOMACHS:

As part of the albacore ecology program, staff members of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu have been routinely examining the stomachs of large fish landed at the Honolulu fresh fish markets and on cruises of the Laboratory's research vessel, the M/V Charles H. Gilbert, in order to monitor the occurrence of juvenile albacore. Although young tuna of other species have been successfully captured by midwater trawls, plankton tows, and dip-netting at night-light stations, these methods have not been successful in capturing juvenile albacore. At present, the most promising "collectors" of juvenile albacore appear to be the large pelagic fish which prey on them.

Since the inception of this project, a total of 12 juvenile albacore has been found. These were found in stomachs of predators caught in widely scattered locations, from $171^{\circ}02'$ E. long. to the Hawaiian Islands, between 19° and 24° N. lat., in the North Pacific, and $178^{\circ}46'$ E. to $162^{\circ}45'$ W. long., between $06^{\circ}32'$ S. and $15^{\circ}35'$ S. lat., in the South Pacific. The discovery of these juveniles tends to corroborate past studies on the spawning of albacore, based on gonads, which indicated that albacore may spawn over wide areas in the North and South Pacific.

As would be expected of specimens found in stomachs, most of the juveniles were somewhat damaged by digestion. However, the specimens were easily recognized as scombrids by the body contours and the shape of the head. They were positively identified as albacore on the basis of a striking vertebral character which is definitive for albacore, plus other supplementary characters. This striking character is the unique laterally flattened shape of the haemal spine on the first caudal vertebra in the albacore. It is interesting to note that although in the past several investigators studied the morphology of the albacore in great detail, the diagnostic value of this character was not recognized by any of them. It is only relatively recently that this character has been used in identifying albacore, especially those occurring in stomachs, or predators. Albacore were identified as small as approximately 6 centimeters (about 2.4 inches) in fork length by this character.

Efforts to sample juvenile albacore by the examination of the stomachs of predators will be intensified. As more juveniles are recorded, major spawning and nursery grounds of albacore in the North and South Pacific may be located. Adequate sampling throughout the year will help elucidate the problems of seasonality of spawning and age and growth during the early stages of the albacore's life history.



Federal Purchases of Fishery Products

VETERANS ADMINISTRATION REQUIREMENTS FOR CANNED FISH FROM NEW PACKS:

Early in 1963 the Veterans Administration announced its estimated requirements of var-

Veterans Administration Requirements for Canned Fish from New Packs		
Canned Products	Can Size	Quantity (Dozen Cans)
Salmon, red or sockeye .	1 lb.	22, 800
Salmon, red or sockeye, dietetic	No. 1/2	8, 700
Sardines	No. 1	4, 800
Tuna, light meat, chunk, in vegetable oil	4 lbs.	6, 300
Tuna, dietetic.	No. 1/2	8, 900

ious canned food products, including fishery products.

Items listed are purchased by the Marketing Division for Subsistence, Veterans Administration Supply Depot, P. O. Box 27, Hines, Ill.



Gulf Exploratory Fishery Program

"OREGON" PARTICIPATES IN INTERNATIONAL SURVEY OF TROPICAL ATLANTIC:

The U. S. Bureau of Commercial Fisheries exploratory fishing vessel M/V Oregon (Cruise 84) left on February 4, 1963 for a 2-month cruise in international waters off the northeastern coast of South America.

The Bureau's vessel will comprise one unit of the International Cooperative Investigation of the Tropical Atlantic (ICITA) investigation and will maintain radio contract with other vessels of the investigation, including the Bureau's newly acquired Geronimo, the

U. S. Coast and Geodetic Survey vessel Explorer, 2 vessels (the Chain and the Crawford) from the Woods Hole Oceanographic Institution, and oceanographic and naval vessels assigned to the ICITA by the Governments of Argentina, Brazil, Ivory Coast, Nigeria, Congo, and the Soviet Union.

In addition to ICITA participation, for which hydrographic investigations will be undertaken, objectives of the cruise are: (1) to make a preliminary assessment of the distribution and availability to bottom trawls of the food fishes of the Continental Shelf off the Guianas and northern Brazil; (2) to extend shrimp explorations southeastward on the Continental Shelf to longitude 40° W., and onto the Continental Slope along the Guianas; and (3) to obtain additional information on the surface schooling tunas of the Gulf of Mexico, Caribbean Sea, and southwestern North Atlantic.



Halibut

HEARING HELD ON PROPOSED JAPANESE FISHING IN EASTERN BERING SEA:

A joint United States Senate-House delegation held a hearing in mid-February at Seattle, Wash., on the proposal to open the Eastern Bering Sea to Japanese halibut fishermen. The North Pacific Fisheries Commission (United States, Canada, and Japan) in November 1962 voted to open this area to Japanese fishermen for the first time. The Congressional delegation also investigated the effects of Japanese fishing on the valuable Bristol Bay run of red or sockeye salmon. The hearing followed a special meeting of the Commission early in February in Tokyo on conservation regulations for the proposed Japanese halibut fishery.

The annual meeting of the International Pacific Halibut Commission (United States and Canada) in Petersburg, Alaska, January 29-31 also preceded the mid-February hearing at Seattle.



Industrial Fishery Products

U. S. FISH MEAL, OIL, AND SOLUBLES, PRODUCTION, JANUARY 1963:

Preliminary data on U. S. production of fish meal, oil, and solubles for January 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the

Area	U. S. Production ^{1/} of Fish Meal, Oil, and Solubles, January 1963 (Preliminary) with Comparisons			
	Meal Short Tons	Oil 1,000 Gallons	Solubles . . (Short Tons) . .	Homog- enized ^{3/}
January 1963:				
East Gulf Coasts . .	524	7	84	50
West Coast ^{2/}	1,485	39	1,251	-
Total.	2,009	46	1,335	50
Jan. 1962 Total . . .	2,732	93	1,597	40

^{1/}Does not include crab meal, shrimp meal, and liver oils.

^{2/}Includes Hawaii, American Samoa, and Puerto Rico.

^{3/}Includes condensed fish.

International Association of Fish Meal Manufacturers are shown in the table.

* * * * *

NEW USES FOR FISH OIL EXPLORED:

In order to promote greater use of fish oil in animal feeding, a U. S. Bureau of Commercial Fisheries animal nutritionist in late November and early December 1962 contacted representatives of corporations at Chicago and Cincinnati. Subsequently, he spent some time in Texas pointing out the values of fish products in livestock feeding to mixed-feed and livestock producers and studying the possibility of using fish oil in the huge cattle-fattening operations now being organized in the Western States.

A large producer of canned petfood, contacted at Chicago, now plans to experiment with fish oil in dogfood. The polyunsaturated nature of fish oil is expected to add to the glossiness of the dog's coat. If the experiments are successful, the concern will use fish oil in its commercial product, and doubtless other concerns will follow suit.

Some Texas mixed-feed producers use fish meal in liberal amounts in critical rations but, as a general rule, the level of utilization in that State is low, being only 2 or 2-1/2 percent even in critical rations. Several mixed-feed producers stated that they have never increased the level of fish meal in their mixed rations since the levels were lowered in response to the price rise that reached its peak in December 1958. Some feed producers feel that present prices of fish meal are high.

A special effort was made to determine whether or not fish oil can be used in the large-scale cattle-fattening operation now being started in the Western States. At present, heated fats are sprayed over hay just before it goes through a chopper, the fat serving to lubricate the chopper and reduce loss in the form of dust from 5 to only 1 percent of the hay. Off-hand, fish oil would appear to be superior for this use because it can be sprayed without heating. The polyunsaturated state of the oil would be no disadvantage because the chopped hay is consumed right after it leaves the chopper, and there would be very little opportunity for undesirable oxides to form. Specialists at a Texas college stated that they could see no reason why fish oil should not be tried in cattle feeding. A cattle feeder, to whom the college technologists broached the subject, agreed to use two tons of fish oil in feeding 100 head

of cattle if the oil was donated. The head of an animal science department in another Texas college agreed to carry out pilot studies on the use of fish oil in cattle feeding if the oil was supplied free.

The director of one of the smaller experiment stations in Texas is experimenting with menhaden oil at a level of 5 percent in broiler starter rations to be fed for a period of 5 or 5½ weeks. Following the starter ration, a finisher without fish oil will be fed. The objective of the trials is to find out whether or not undesirable flavors of poultry meat can be avoided when relatively high levels of fish oil are fed for a limited period of time.

The nutritionist of one Texas feed concern plans to use a blend of equal parts of menhaden oil and stabilize fat in poultry rations.

The Bureau's animal nutritionist was told by members of the staff of one southern university that since his visit last summer they have started experimenting with menhaden oil in grain rations for calves. At levels of 2½, 5, and 7½ percent, fish oil in the ration seems to be highly relished by calves, but at 10 percent there is some decrease in feed intake. No digestive disturbances or other unfavorable effects have been observed since the oil feeding was begun. No data on growth rates or feed efficiency are, as yet, available on these trials.

Note: See *Commercial Fisheries Review*, December 1962 p. 44.

* * * * *

USE OF FISH OIL IN HIGHWAY CONSTRUCTION INVESTIGATED:

Possible use of fish oil in highway construction has been investigated by the Technical Advisory Unit of the U.S. Bureau of Commercial Fisheries. This investigation was initiated by questions from fish oil brokers who had heard of the possible use of fish oil in concrete and from fish oil producers and processors who were looking for improved outlets for byproducts, such as soap from alkali refining and stearine from cold pressing of fish oils. The use of fish oil in highway construction is based upon the need to increase the resistance of concrete to damage from repeated freezing followed by thawing with the heavy applications of salt used to reduce the hazard of winter driving under ice and snow conditions.

Highway builders have found that the best defense against serious surface scaling and structural breakdown of concrete under freeze-thaw conditions is the entrainment of many fine air spaces properly sized and distributed in the concrete. This is accomplished by entraining air bubbles in the concrete during the mixing. The size, distribution, and stability of these bubbles in the wet concrete is controlled through the use of an additive called an air-entraining agent, which is either mixed in the cement at the mill or used in solution as an admixture at the concrete mixer. Fish oil or its soaps can be used as such an air-entraining agent. In the early development of air-entrainment in concrete, fish oil figured prominently, but was dropped for economic reasons about 1940. Since that time both the techniques of air-entrainment and the price of fish oil relative to the currently used products have shifted toward easing the entry of fish oil into this market. The dominant products in this market today are neutralized pine resin and organic salts of sulfonated hydrocarbons. Prices are reported from a low of 5.5 cents a pound of solid material before neutralization in carload lots f.o.b. southern states to a high range of 65 cents to a dollar per gallon of solution. These solutions may contain from 8 to 25 percent of air-entraining agents and are intended for addition at the concrete mixer.

The market for air-entraining agents today for highway construction and for masonry cements amounts to about 10 million pounds per year. This market is even further expanded by the movement of air-entrainment into other applications such as dam construction, canal linings, and even into general structural concrete. The improved handling characteristics in pouring of the fresh air-entrained concrete

compared to regular concrete are extending the use of air-entrainment rapidly.

The first step in putting fish oil or fish-oil soaps into this market would be by having performance tests conducted by a cement laboratory regularly inspected by the U.S. Bureau of Standards. Satisfactory performance in these tests would open the way to evaluation of fish oil products by the U.S. Bureau of Public Roads and by the various state highway departments.

The market for air-entraining agents for concrete could serve the fish oil industry in the following ways: (1) to broaden the base of the fish-oil market and act as an aid in buffering against price drop such as was experienced in 1962, (2) to utilize soap stocks resulting from alkali refining of fish oil, and (3) to provide an improved market for stearine obtained in the cold pressing of the oil.



Inventions

NEW FISHING REEL WITH "HYDRAULIC" BRAKE PATENTED:

The drag on a new fishing reel is provided by a manually operated recirculating hydraulic pump in place of the conventional friction brake. The drag is adjusted by regulating the flow between the input and output side of the pump. The inventor claims that the device requires no maintenance over a long life period. It is made of metal or plastic and said to be simple, reliable, and inexpensive. (Patent Number 3,034,604, U.S. Patent Office Classification Number 188-90, granted Stanley B. Holmes, 1126 19th St., Santa Monica, Calif.)

* * * * *

NEW PLASTIC COATING FOR FISH LURES PATENTED:

A new patented fish lure accessory consists of narrow strips of adhesive coated plastic sheet material that can be applied to any conventional lure. The inventor claims that it can be made in any color, is waterproof, and does not affect the action of the lure. The adhesive portion has a backing material which is peeled off prior to use. The plastic material can be made in long sheets that can be folded or rolled. Suitable portions for various lures are then simply torn off. (Patent Number 3,021,632, U.S. Patent Office Classification Number 41-10, granted Leslie J. Gombar, 12591 Glenfield, Detroit 13, Mich.)



Irradiation Preservation

MULTIPLE-IRRADIATED HADDOCK FILLETS EVALUATED FOR QUALITY:

To determine if treating fresh skinless haddock fillets with multiple doses of ionizing radiation at a ten-day interval affects the organoleptic quality, experiments have been conducted by the U.S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass.

Initially, skinless haddock fillets were irradiated at dose levels of 50,000, 150,000, and 250,000 rads.^{1/} At the end of ten days storage at 33° F., the fillets were again irradiated with two additional series of dosages.

Difference tests were conducted on the fillets immediately following the final application of irradiation, and at ten-day intervals thereafter for a period of 30 days.

The difference tests indicate that haddock fillets receiving multiple dosages can be held

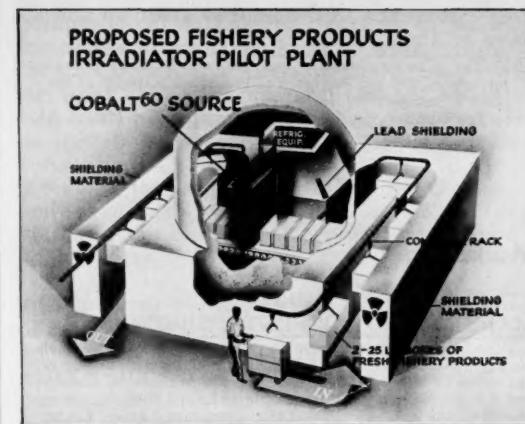


Fig. 1 - Drawing of the proposed marine products irradiator scheduled to be constructed in Gloucester, Mass., by the Atomic Energy Commission and operated by the Bureau of Commercial Fisheries personnel.

at storage temperature of 33° F., without spoilage, for 30 days. There was not signifi-

RADIATION PRESERVATION OF SEAFOOD

U.S. DEPARTMENT OF THE INTERIOR - BUREAU OF COMMERCIAL FISHERIES

FRESH SEAFOOD ON ICE WILL KEEP ABOUT 14 DAYS

IRRADIATION
WILL DOUBLE THIS
KEEPING TIME AND
INCREASE
FRESH FISH SALES

HIGH QUALITY
FRESH FISH
WILL REACH

INLAND MARKETS

COOPERATIVE AGRICULTURE GOVERNMENT-INDUSTRY STUDIES

TECHNOLOGICAL RESEARCH
WILL ENABLE YOU TO EXTEND YOUR
MARKETS FOR FRESH FISH BY

- selecting suitable species
- determining optimum radiation levels
- establishing maximum storage time at different storage temperatures
- providing for FDA wholesomeness clearance
- testing and selecting packaging materials
- conducting economic feasibility analysis

Fig. 2 - Exhibit demonstrating the usefulness of radiation preservation of seafood.

cant difference in the scores after 10 and 20 days of storage.

1/Rad=The quantity of ionizing radiation which results in the absorption of 100 ergs per gram of irradiated material at the point of interest.

Note: See Commercial Fisheries Review, February 1962 p. 43.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SPRING 1963:

The United States domestic catch of fish and shellfish during 1962 amounted to 5.2 billion pounds with an ex-vest value of about \$385 million, up 2.0 percent in quantity and 5.8 percent in value from the catch in 1961. Fish and shellfish for human consumption comprised about 2.6 billion pounds of the 1962 catch, up slightly from 1961. The remainder was used for the manufacture of industrial products, bait, and animal food. The 1962 catch was the second largest domestic catch, being surpassed only by the record catch of 5.3 billion pounds in 1956.

Supplies of fish and shellfish during the early spring months of 1963 should be slightly more plentiful than in the



comparable 1962 period because of larger frozen inventories. Cold-storage holdings of edible fishery products on January 1, 1963, totaled 218.1 million pounds, about 33.1 million pounds more than a year earlier. Adequate stocks of most varieties of canned fishery products were on hand at the beginning of 1963. Fresh fish landings which are seasonally light during the winter months should increase with the arrival of spring weather when most commercial fisheries begin full operation.

Imports of most edible fishery products into the United States during 1962 were greater than in 1961. Continued high imports are expected early in 1963. Exports of edible fishery products during 1962 were generally higher than a



year earlier, except for canned and frozen shrimp, canned sardines, and fresh or frozen oysters.

Retail prices of fishery products in 1962 averaged about 4 percent higher than in 1961. They increased during last summer, decreased a little in early fall, then increased again slightly at the end of 1962. Prices should remain at the year-end level during the early spring months of 1963, but probably will soften slightly toward the end of that period.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's February 1963 issue of The National Food Situation (NFS-103).



National Aquarium

PLANS EMPHASIZE RESEARCH AND EDUCATIONAL ROLE FOR PROPOSED AQUARIUM:

The proposed National Fisheries Center and Aquarium for Washington, D. C., "will emerge as one of the world's foremost aquatic biological research centers as well as providing a self-supporting visitor attraction combining entertainment and education," the Secretary of the Interior stated on December 10, 1962.

His remarks followed several weeks of advance planning and consultation out of which a preliminary picture of the Center is beginning to emerge. Final plans for the Center will take about 18 months to complete and it is estimated 2 years will be required for construction.

The Interior Secretary emphasized that 18 months of engineering and architectural planning will be required even after initial funds have been appropriated for the project authorized by the 87th Congress. Authorized cost of the project is \$10 million, to be amortized over a 30-year period by modest admission charges.

Some suggestions which will be presented to the Center's advisory board, required by the Congressional authorization, were:

1. The Center would display more than 1,000 species of fish, amphibians, and invertebrates in natural surroundings such as huge indoor and outdoor pools providing viewing from different levels, including an undersea panorama. Included in preliminary discussions are provisions for providing a trout

stream, discharging into a bayou accommodating bass, as well as outside facilities for seals, sea lions, walrus, sea elephants, and sea otter. Other specially-designed facilities would be provided for tropical fish.

2. The Fisheries Center will provide unequaled facilities and specimens for aquatic research, which would include studies on genetics and selective breeding, nutrition, marine diseases, experimental ecology, behavior of aquatic organisms, antibiotics produced by marine animals, and new food sources from the sea, all designed to complement research activities of the Department's Fish and Wildlife Service.

Other areas of research will be provided for graduate students in marine subjects, plus provisions for educational motion pictures and seminar rooms to be made available to the public as well as for fisheries groups and meetings.

The Secretary stated he was hopeful that the actual architectural design would be determined by requirements for exhibits, research facilities, traffic patterns, etc. His advisors have been most emphatic on the point that rather than design a building and then fit the exhibits and other facilities into it, the reverse procedure should be utilized for maximum efficiency.



North Pacific Exploratory Fishery Program

ABUNDANCE OF ADULT HAKE AND EFFICIENCY OF PELAGIC TRAWL TO BE INVESTIGATED:

M/V "John N. Cobb" Cruise 58: An investigation of the relative abundance of adult hake and the catching efficiency of the Cobb pelagic trawl was the objective of a cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb which began on February 25, 1963. The area of operations will be in waters between Point Conception, Calif., and Cedros Island, Mexico seaward to about 300 miles.

Prior to departure of the John N. Cobb, cooperating research vessels Black Douglas and Alaska used plankton nets and small mid-water trawls to pinpoint areas having an abundance of hake eggs and larvae. If concentrations of eggs and larvae are found to co-

incide with predicted abundance, the Cobb pelagic trawl will attempt capture of spawning adults at standard stations along California Cooperative Oceanic Fisheries Investigations lines 80 through 120 (Point Conception to San Diego up to 200 miles offshore) as time and weather permit. Effort will be concentrated between lines 80 and 100. In the event that significant numbers of eggs and larvae are not found to coincide with predictions, the station pattern will be altered accordingly.

Whenever relatively large concentrations of adult hake or other pelagic species are encountered, the programmed station pattern will be interrupted to allow simulation of commercial fishing operations employing Cobb pelagic trawls constructed of conventional webbing and unconventional monofilament webbing. In addition, a British Columbia-type herring trawl will be fished to test its efficiency relative to capturing rates of Cobb pelagic trawls.

A recently installed sonic telemeter will be used at all times to determine the depth of the trawls.



Oceanography

COMMERCIAL FISHERIES BUREAU ESTABLISHES OCEANOGRAPHIC INSTRUMENTATION PROGRAM:

An Oceanographic Instrumentation Program was established about the latter part of 1962 at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Washington, D. C.

The four areas of the program are: (1) The coordination of oceanographic instrumentation developments within the Bureau of Commercial Fisheries; (2) development, testing, and evaluation of new instruments for the Bureau, either directly or in cooperation with industry, nonprofit research organizations, other Bureau Laboratories, and Federal and State agencies; (3) effecting liaison with other government Bureaus by participation on panels and committees of the Interagency Committee on Oceanography and other groups concerned with oceanographic instrumentation; and (4) servicing of instruments for the Bureau's Biological Laboratory.

Of the four areas, major effort will be expended in areas (1) and (2). The Bureau's requirements for oceanographic instruments will be continuously reviewed. The program will provide information as to instrumentation developments, and will maintain a compilation of those instruments required for use by Bureau activities. It will recommend priority for allocation of funds, both to meet the requirements and to develop regional instrumentation capability, and will publish newsletters, proposal reviews, and reports necessary to accomplish this. The development functions will be coordinated with those of other agencies. Contracts will be left to industry to develop instruments to meet the specialized requirements of the Bureau, and to aid in extending industry's capabilities to produce instruments for the Bureau and for the oceanographic community in general.

* * * * *

ADDITIONAL OCEANOGRAPHIC INSTRUMENTATION TO BE ADDED TO COAST GUARD VESSELS:

The U. S. Coast Guard is authorized by recent Congressional legislation to conduct oceanographic research from its many facilities--weather ships, ice breakers, offshore towers, patrol cutters, and other coastal installations of the Coast Guard.

The Coast Guard operates 32 vessels which are assigned to Pacific and Atlantic Ocean weather stations. It is planned to outfit those ships with oceanographic instruments for continuous full-scale observations. The Coast Guard cutter Casco, based at Boston, Mass., is the pilot installation. Another installation was completed at the Coast Guard shipyard at Curtis Bay, Md., on December 15, 1962.

Such installations include an oceanographic laboratory, deep-sea oceanographic winch,



The Coast Guard cutter, Casco, one of the vessels on which oceanographic instruments were installed.

wave-height sensor, salinometer, Nansen bottles, surface temperature probes, and other equipment for measuring physical and chemical properties.

The Boston-based Coast Guard cutter Casco will serve as a test for the inaugural program from January 1 through July 1, 1963.

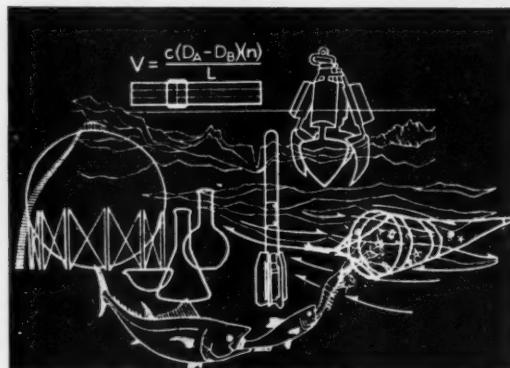
During Fiscal Year 1964, the Coast Guard hopes to outfit 8 to 12 additional weather ships. As new and more modern sensors and equipment are developed they will be added to the weather ships. (National Oceanographic Data Center Newsletter, December 31, 1962.)

Note: See Commercial Fisheries Review, February 1962 p. 102.

* * * * *

NATIONAL OCEANOGRAPHIC INSTRUMENTATION CENTER ESTABLISHED:

A new Oceanographic Instrumentation Center at Washington, D.C., was dedicated on January 18, 1963. It is located in the same



Artist's concept of the studies to be aided by the newly established Oceanographic Instrumentation Center.

building as the National Oceanographic Data Center.

The need for better testing and calibrating of oceanographic instruments has been recognized for some time but adequately equipped and staffed facilities have not been available. The Interagency Committee on Oceanography Panel on Instruments and Facilities appointed a Committee to study the need for an Instrumentation Center. The Panel concluded, and it was the recommendation of the Interagency Committee on Oceanography to the Federal Council of Science and Technology, that a test and calibra-

tion facility was definitely needed, if not over due. The Panel also indicated that because of the anticipated increase in oceanographic work, a facility on both the East and West Coast would ultimately be required. Meanwhile, it was agreed that the Navy Oceanographic Office should establish a Center to function as a prototype for the National facility. The Commander of the U. S. Naval Oceanographic Office was able to obtain funds for the complete renovation of 40,000 square feet of Building 160 at the Naval Station, Navy Yard Annex, Washington, D. C. (formerly the Naval Weapons Plant) into a proper and fully equipped installation. Construction work started in July 1962.

The new Center will provide facilities and staff for carrying out a broad program of development, testing, calibration and evaluation of oceanographic instruments. It will also provide advice and assistance to agencies and activities on oceanographic instrumentation matters as called upon. In addition, the Center will serve as a clearing house for information on the oceanographic instrument development program.

The Center contains engineering facilities for laboratory and contractual development, test and evaluation, and maintenance of instruments. New instruments now under development include improved electronic bathythermographs, shipboard wave recorders, shipboard survey instruments, submerged buoy systems, and sound velocimeters.

To carry out this engineering program, the Center is being equipped with pressure test vessels, shock and vibration test equipment, tensile test facilities, pressure and temperature tanks, additional reversing thermometer calibration equipment, a 60-foot clear water instrument test tower, and a small craft for environment testing in local waters. (National Oceanographic Data Center Newsletter, December 31, 1962.)



Oregon

SCUBA DIVING MORE EXTENSIVELY USED FOR UNDERWATER OBSERVATION:

The increasingly popular sport of SCUBA diving is being more extensively used by personnel of the Oregon Fish Commission. Over

20 staff members are trained in the use of such gear.

SCUBA refers to "self-contained underwater breathing apparatus." The equipment is of the popular navy frogman type--rubber or "wet" suit for insulation, face mask, oxygen tank with breathing tubes, and swim fins. It differs from the diving suits with long air lines extending down from a floating station above the diver, in that the air supply is self-contained and the outfit is much less cumbersome.



SCUBA divers have learned many things about fish and fishing.

SCUBA is applied successfully on a variety of Commission projects where underwater observation is desirable. The initial work was done in connection with fish passage at hydroelectric projects and certain construction works of the Commission. Underwater inspections of the Brownlee Reservoir net on Middle Snake River helped materially in evaluating that controversial fish-collection facility. At Walterville Canal on the McKenzie River and Willamette Falls near Oregon City, Commission divers have taken part in cooperative periodic operations with industry which were designed to move fish past obstructions at critical times. Assistance with the installation of water-control facilities at the outlet works of Wahkeena Rearing Pond in the Columbia River gorge, and of fish racks in hatchery streams are other notable examples where SCUBA diving is being used effectively in Commission programs.

A more recent use of SCUBA diving was in the study of juvenile salmon behavior in reservoirs, conducted early in 1963 in North Fork Reservoir on the Clackamas River, and Lake Siskiyou, behind Pelton Dam on the Deschutes River. Because young salmon are generally found in the streams, knowledge of their behavior as they pass through reservoirs seaward is of great importance in evaluating many fish passage problems.

Personnel of the Oregon Fish Commission also used SCUBA gear during the summer of 1962 for underwater observations of spring chinook in the Wilson, Trask, and Salmon

Rivers to gather needed data on location of adult resting pools, determination of juvenile rearing areas, and enumeration of fish seen. Underwater photographs were made during some phases of the work. Spring chinook are found in deep holes during the summer as they wait for fall freshets to signal movement to their spawning beds. Observation from the bank, because of limited visibility, does not give a complete picture of run-size and survival conditions. Juvenile salmon are not readily visible in swift water, thus SCUBA observations are of great value in that type of work.

Another important project was the pilot study of natural rearing of silver salmon in Hall and Schutpeltz Lakes of the Tenmile Lakes system on the southern Oregon coast near Coos Bay. By using SCUBA gear, Commission personnel are learning the habits of planted fry and some of the factors which might limit production in lakes of this type.

Besides the lake and stream work, the Pacific Ocean is explored quite often by marine biologists. Interest in taking red abalone commercially from the southern Oregon coast prompted Commission personnel to observe the abundance of those large shellfish to determine if they occurred in commercial quantities. So far, SCUBA divers have found the relative numbers of abalone, even offshore, not to be of a size sufficient enough to warrant a commercial fishery. SCUBA work has also been done in connection with offshore oil explorations to determine by actual observation of seismic explosions what the effect is on marine life.



Oysters

CHESAPEAKE BAY OYSTER DEATHS DUE TO MSX DECLINED IN 1962:

The head of oyster disease research at the Virginia Institute of Marine Science, told the Fifth Annual Shellfish Mortality Conference on January 29, 1963, that deaths due to MSX declined during 1962 in marginal areas of Chesapeake Bay, although the range of the dreaded oyster disease remained the same as in 1960 and 1961.

"Pocomoke Sound and Bayside of Eastern Shore creeks were replanted without serious losses in 1962," he reported. "The disease decline in these areas may be due to the loss

of large beds in adjacent areas which sustain the concentration of the disease and enable its reinestation into the marginal areas."

He indicated that incidence and mortality continued at high levels in Mobjack Bay and at Tillage's ground just above York River Bridge in 1962. He added that tray oysters suspended in the York off the Institute's pier showed variable but mostly light MSX activity, and late summer infections formerly noted failed to occur among those oysters in 1962.

In the James River, MSX declined from a level of 30 to 40 percent in late fall and winter to zero incidence in late April 1962, according to the Virginia scientist. New infections were scarce in the summer of 1962, and incidence remained low as late as December 1962. James River seed, including Brown Shoals, is essentially free of MSX infections for the 1962-1963 planting season.

"There is strong indication that decimation of oysters in Hampton Roads by MSX has affected setting in the James River seed area," he stated. "Spatfall was extremely light in James River for 1961 and 1962. This may be due to the depletion of oysters at Hampton Roads, which in turn may be brood stock for the James River seed."

It was pointed out that significant planting has not occurred this year in Chesapeake Bay, Hampton Roads, the lower York River, and the lower Rappahannock River. Production, yields, and profits have been excellent in the low-salinity areas above these infested sections. Use of limited quantities of MSX-infected seed in low salinity planting areas has caused no known losses. Commercial oysterling continues on seaside of Virginia's Eastern Shore with few losses to MSX, and future prospects appear excellent.

Discussing other oyster diseases, the scientist indicated that the fungus parasite Dermocystidium was absent from Mobjack Bay and the lower York River, although it remains active in all high salinity areas where populations of oysters exist.

The conference on shellfish diseases was held at the Oxford, Md., Laboratory of the U. S. Bureau of Commercial Fisheries from January 28 to 30, 1963. Biologists and research administrators from marine laboratories along the Atlantic, Pacific, and Gulf coasts meet annually in that conference to

consider problems as associated with the recognition, study, and control of oyster diseases.



Pollution

MARINE SCIENTIST DISCUSSES PESTICIDES:

The conflict between various resource interests over the use of chemical pesticides was recently pointed out by a scientist who is in charge of the Ecology-Pollution Department of the Virginia Institute of Marine Science.

Speaking at Gloucester Point, Va., January 23, 1963, he said, "There are over 12,000 brand name formulations of more than 200 basic chemical pesticides on the market today, and over a billion pounds of the products are sold annually. These include insecticides, herbicides, fungicides and nemacides.... Insects are perhaps man's greatest challenge on earth. Of the 2 million or more species, less than 10,000 are considered injurious, but these inflict an estimated 4 billion dollars worth of damage in the United States annually. Also, control procedures must frequently be changed because the insect pest has developed a resistance to the older insecticide."

But he pointed out that the potent chemicals in use today destroy beneficial species as well as pests. Frequently it is necessary to apply chemical agents over large areas to control an invasion of a pest species. The effective life of different control agents may vary from a few days to a decade or more. Insecticides may be washed off the treated areas and destroy aquatic resources. In many areas during the 1950's, some of the most toxic and long-lived insecticides were employed in salt-marsh mosquito and sand fly control programs. The result was wholesale destruction of marine life. Warm-blooded animals including man are not immune to the toxic effects of the chemical agents.

Emphasizing the need for discretion and serious thought in regard to pesticide applications in order to restrict the damage and to prevent future problems and hazards, he said, "The Institute is aware of the necessity for the use of pesticides for the efficient production of farm, garden, and aquatic food products. We do, however, urge that all the

available knowledge be utilized in reaching decisions that may have an affect on other natural resources. It should be further understood that in many cases we do not have knowledge complete enough to make really careful decisions. Thus, more research and a cautious attitude is necessary.... Costs cannot be the major deciding factor in pesticide applications."

Discussing the prospect of eliminating the problems caused by insecticide use, he said that research on biological controls and resistant species must be accelerated. The necessity for chemical control will persist, but additional information about the effect of pesticides on the total environment can reduce damage to non-pest organisms.

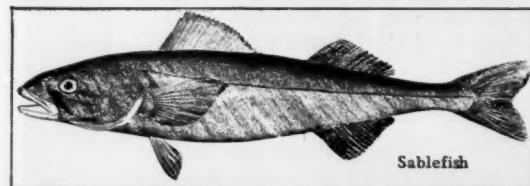


Sablefish

SABLEFISH TAGGED IN WASHINGTON STATE RECOVERED BY JAPANESE VESSELS:

Japanese fishing vessels operating in the Bering Sea in 1962 caught three sablefish tagged and released in Washington State coastal waters in 1955 and 1956. Recovered in the vicinity of the Pribilof Islands, Alaska, as nearly as can be determined, the fish had traveled about 2,000 miles. The first fish was taken 6 years and 42 days from the date of its release in Holmes Harbor, Wash. The second fish roved the North Pacific for 7 years and 53 days before being captured, while the third fish was out 6 years and 101 days.

The fish were tagged with both Peterson and spaghetti tags. The yearly rate of growth



Sablefish

for the two sablefish for which there was complete data was just over 3 centimeters.

Washington State biologists tagged 890 sablefish in 1955 and 659 sablefish in 1956. A total of 143 sablefish tagged in those years have been recovered, mainly in coastal waters of Washington State and British Columbia, Canada.

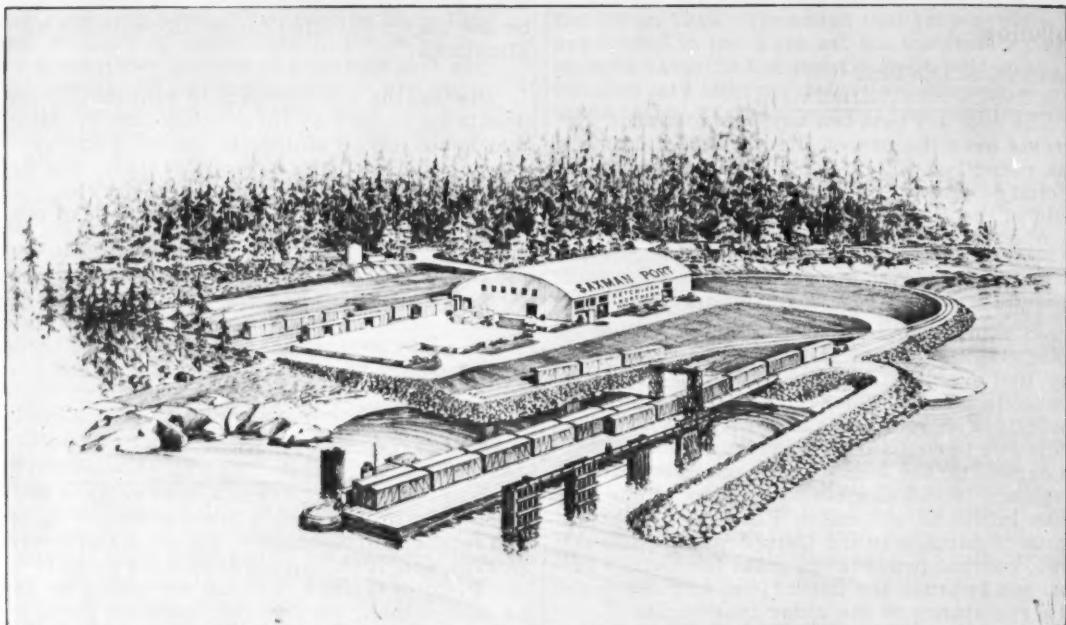


Transportation

NEW RAIL-BARGE FREIGHT SERVICE TO S. E. ALASKA VIA PRINCE RUPERT, B. C.:

A new freight terminal began operating in Saxman, Alaska (near Ketchikan), the latter

Shipments by United States suppliers to the Saxman terminal of less than carload weight will be billed to Chicago, Ill., for consolidation to carload lots and movement to Prince Rupert, B. C., by rail. According to reports, the new Saxman service will reduce freight



Artist's drawing of freight terminal in Saxman, Alaska.

part of February 1963. The terminal has truck and ferry connections to all cities in Southeastern Alaska. Rail connections to the lower 48 States are provided by a barge service between Saxman, Alaska, and Prince Rupert, B. C. The barge, which has a capacity of 20 carloads, was scheduled to begin once-a-week trips on February 13, 1963. The barge trip takes 11 hours. On arrival at Saxman, freight cars will be switched from the barge to a covered warehouse for unloading and distribution.

Distribution from the warehouse will be made by truck using the new Alaska Ferry System to all cities in Southeastern Alaska, and including Wrangell, Juneau, Petersburg, Sitka, Haines, and Skagway. Charges for warehouse handling and distribution to ultimate destination were under consideration and were to be furnished before operation started.

costs (estimated to average 40 percent) between Southeastern Alaska and those United States points which now have parity rates to Prince Rupert, B. C., versus Seattle, Wash.

The Saxman terminal was built with the assistance of Area Redevelopment Administration funds.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, JANUARY 1963:

Item and Period	1963	1962	1961	1960	1959
. (1,000 Lbs., Heads-Off)					
Total landings, So. Atl. and Gulf States:					
March	-	3,317	4,754	4,098	2,950
February	-	4,125	3,910	3,785	3,227
January	5,000	3,828	5,686	5,401	4,310
December	-	8,530	6,538	7,097	8,716
January-December	-	105,100	91,396	141,035	130,659

(Table continued on following page.)

Item and Period	1963	1962	1961	1960	1959
..... (1,000 Lbs., Heads-Off)					
Quantity canned, Gulf States ^{1/} :					
March	-	94	38	128	93
February	-	263	98	223	135
January	510	536	199	289	308
December	-	2,050	889	977	1,278
January-December .	-	25,277	15,793	28,594	24,679
Frozen inventories (as of end of each mo.) ^{2/} :					
March 31	-	16,607	31,345	23,232	24,893
February 28	-	19,012	37,612	29,063	27,555
January 31	-	21,328	37,842	34,332	30,858
January 1	31,577	28,372	19,755	40,913	37,866
November 30	-	27,500	20,668	37,264	37,334
October 31	-	21,315	17,811	31,209	33,057
September 30	-	12,843	13,361	24,492	26,119
Imports ^{3/} :					
March	-	9,658	10,347	8,545	8,492
February	-	10,599	8,932	7,657	7,481
January	4/	12,907	12,338	8,596	8,238
December	-	15,798	15,442	12,411	10,611
January-December .	-	141,384	126,268	113,418	106,555
..... (¢/lb., 26-30 Count, Heads-Off).					
Ex-vessel price, all species, Gulf Ports:					
March	-	80.9	56.0	56.3	67.6
February	-	78.9	53.5	51.8	69.6
January	5/ 86-93	76.3	52.5	49.4	70.9
December	-	77-90	75.2	54.2	48.4
November	-	78-93	73.5	54.0	46.2
Aug., Sept., & Oct.	-	88-100	68.3	52.4	45.8
May, June, & July	-	83.1	54.5	58.1	54.0
Wholesale price for froz. domestic brown species (5-lb. pkg.) at Chicago, Ill.:					
March	-	94-95	69-71	65-68	81-83
February	-	93-95	69-71	65-67	82-87
January	102-106	91-94	69-71	64-66	86-88
December	-	101-109	91-92	68-70	64-66
November	-	105-110	89-92	69-73	60-65
Aug., Sept., & Oct.	-	108-118	76-91	64-73	59-64
May, June, & July	-	96-104	67-75	72-77	62-76

^{1/} Pounds of headless shrimp determined by multiplying the number of standard cases by 33.

^{2/} Raw headless only; excludes breaded, peeled and deveined, etc.

^{3/} Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

^{4/} Not available.

^{5/} Range.

Note: Data for 1963 and 1962 are preliminary. January 1963 data estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



United States Fisheries

COMMERCIAL FISHERY LANDINGS, 1962:

United States commercial fishery landings in 1962 reached a near record of 5.2 billion pounds with an ex-vessel value of \$385 million. The value was \$12 million more than the previous record set in 1958, and \$23 million above the 1961 value. Shrimp was again in first place as the most valuable single fishery.

According to statistics compiled by the U. S. Bureau of Commercial Fisheries, the 1962 landings were below the record of 1956, but somewhat higher than in 1961. Although the increase in domestic landings and in imports of edible fishery products brought the total supply of fresh, frozen, and canned products up to the highest point in history, the United States per capita consumption remained at 10.7 pounds, the same as in 1961. This is attributed primarily to the increase in population, and gains in stocks of frozen and canned fish.

United States Commercial Fishery Landings of Certain Species, 1962 and 1961		
Species	1/1962	1961
Anchovies	2,600	7,712
Cod, Atlantic	47,000	46,591
Crabs:		
Blue	146,600	152,758
Dungeness	8,500	4,592
King	50,000	43,412
Haddock	134,100	133,597
Halibut ^{2/}	39,900	40,024
Herring:		
Maine	158,000	54,463
Alaska	32,000	49,465
Industrial fish, Maine & Mass. ^{3/}	42,700	42,200
Mackerel:		
Jack	90,900	97,606
Pacific	44,600	44,110
Menhaden	2,236,300	2,314,677
Ocean perch, Atlantic	122,500	132,062
Oysters, all species	56,000	62,300
Pollock	17,100	21,406
Salmon	315,000	310,412
Sardines, Pacific	14,800	43,169
Scallops (meats)	24,100	27,461
Shrimp (heads-on)	190,600	174,494
Tuna	307,300	325,804
Whiting	86,100	100,729
Total all above items	4,166,700	4,229,044
Other ^{4/}	1,071,300	954,956
Grand Total	5,238,000	5,184,000

^{1/}Preliminary.

^{2/}Dressed weight.

^{3/}Excludes menhaden.

^{4/}Includes landings for species not listed.

Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

The major part of the 1962 landings consisted of industrial or non-food fish. Industrial fish landings were 2,661 million pounds, 84 million pounds more than the food-fish landed during the year.



Heading of shrimp aboard a fishing vessel.

The 1962 herring landings by Maine fishermen were far short of a record but were nearly three times the 1961 total. Landings of king crab caught off the coast of Alaska set a record of 7 million pounds more than the previous year. North Atlantic groundfish landings were lower in 1962. Cod and haddock landings were about the same as in 1961 but ocean perch and pollock declined from the previous year.

Landings of Pacific sardines dropped sharply in 1962 while shrimp landings were 17 million pounds more than in 1961.

The 1962 salmon pack was slightly lower than in 1961 but the amount of tuna packed set a new record with one million cases more than the previous year. Domestic tuna landings were somewhat lower than in 1961 but record imports of frozen tuna for canning in United States plants boosted the pack to the new record.



U. S. Fishing Vessels

AUTOMATED STERN TRAWLER-PURSE SEINER "NARRAGANSETT" LAUNCHED:

The launching of the Narragansett on January 10, 1963, at Warren, R. I., gave the United States its first commercial stern trawler. The prime feature of the revolutionary 83-foot vessel is an automated over-the-stern net-handling system. The vessel was



Artist's drawing of the new stern trawler-purse seiner rigged with an automated over-the-stern net-handling system.

also designed for purse seining and scallop dredging. It can be converted to either method of fishing in less than a day. Following her trial runs, the vessel will probably work initially as a trawler.

The Narragansett represents an effort by private industry to meet foreign competition by using the technical know-how of the United States. The vessel was built by a firm of

naval architects and shipbuilders in Warren, R. I. It was the aim of the firm to create a vessel to compete with European vessels from the standpoint of cost as well as efficiency. To achieve their goal, the firm used the latest mechanical equipment and unique methods of vessel assembly.

It is also hoped that the vessel's bad weather fishing ability may lead to a 5-day work week for the fishermen. This together with good living conditions and improved working conditions should make fishing a more profitable and comfortable occupation for the Narragansett's crew.

Note: See Commercial Fisheries Review, May 1962 p. 32.

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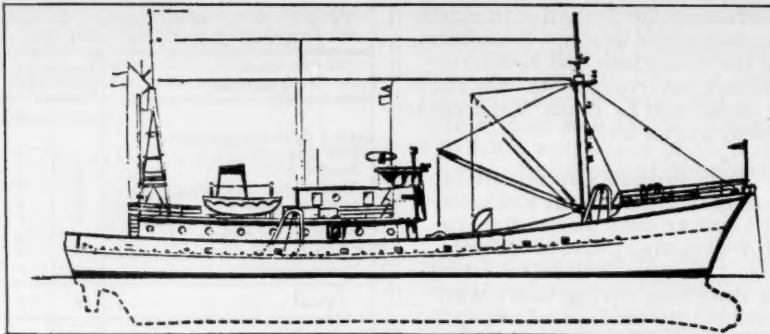
CONTRACT LET FOR NEW PACIFIC OCEAN FISHERY RESEARCH VESSEL:

A \$1,049,935 contract for construction of the M/V Townsend Cromwell, the U. S. Bureau of Commercial Fisheries new combination fishery-oceanographic research vessel, has been awarded to the McDermott Shipyard of Morgan City, La., the Interior Department announced on December 11, 1962. The vessel, to be completed in about a year, will be based in Honolulu, Hawaii.

The vessel is named for the late Townsend Cromwell, a Bureau of Commercial Fisheries oceanographer who discovered what is now known as the Cromwell Current in the Pacific Ocean. This current may be compared to a subsurface river flowing eastward along the Equator.

The Townsend Cromwell will be 158 feet 6-inches long and will have a 33-foot beam. It will have a bulbous bow with viewing ports to permit underwater observation of fish, and cameras will be used to record the behavior of fish for further study.

Shallow draft of the research craft will permit the investigation of coastal areas for tuna bait fish resources. It will carry a variety of winches and other equipment for standard oceanographic work on currents, temperature, and other properties of the sea. A chemical laboratory will facilitate the completion of analysis aboard ship. Other equipment will permit a variety of experimental fishing methods, including the use of long lines, midwater trawls, gill nets, and live bait. The vessel will be operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory in Honolulu.



Outline of the research vessel, Townsend Cromwell, showing the Iniu bulb (under water at the bow) which will increase speed.

Its two Diesel engines, with variable pitch propellers, will permit the wide range of speed necessary for fishery and oceanographic research. Speed can be reduced and maintained at half a knot for plankton net trawling or it can be increased as desired to a 12-knot cruising speed. The vessel will have a range of about 10,000 miles.

The Cromwell Current, which has an estimated volume about 500 times that of the Mississippi River, was discovered in 1952 when Cromwell and others noted that drift buoys with deep drag moved in an opposite direction from those that were strictly surface buoys. The current's core is about 330 feet below the surface and its speed is approximately three knots. Cromwell, a native of Boston, Mass., was killed in 1958 in an airplane crash in Mexico.

* * * * *

SEINE SKIFFS CARRIED ON TUNA PURSE SEINERS NEED NOT BE LICENSED:

The question has arisen as to whether certain boats called "seine skiffs," which are carried aboard large fishing vessels, need to be licensed as fishing vessels of the United States.

The boats in question are described as large, heavily built, flat-bottomed, seine skiffs with straight sides of considerable beam. There are two sizes in general use. One measures 28 feet over-all with a net tonnage of about 7 tons and the other measures 30 feet over-all with a tonnage of about 10 net tons. The skiffs are carried on board large fishing vessels and are used in setting tuna purse seines. The seine skiff is put overboard from the fishing vessel only to hold

the end of the net while it is being set in a circle around a school of fish. The seine skiffs are also used as lifeboats for the fishing vessel.

The U. S. Bureau of Customs, in a January 23, 1963, letter to the Director, U. S. Bureau of Commercial Fisheries, concluded as follows:

"...Since the seine skiffs involved are used only to set the seine nets and are not used in any way with the catching of the tuna, it is the Bureau's opinion that they are not engaged in the fisheries or any other trade. Consequently, there is no affirmative requirement for the documentation of the seine boats described whether or not they measure more than 5 net tons. This decision, however, shall not be construed as a precedent applying to any vessels other than those described.

"The Collectors of Customs at San Francisco, Los Angeles, and San Diego, California, are being notified of the Bureau's ruling in this regard."

* * * * *

WEATHER CONDITIONS REPORTED BY RADIO WHILE ON TUNA FISHING TRIPS:

Four tuna purse-seiners operating out of California fishing ports have been outfitted with radio frequency 8805.6 kilocycles, which will permit them to communicate by voice directly with the U. S. Bureau of Commercial Fisheries radio station located on the campus of Scripps Institution of Oceanography, La Jolla, Calif. The vessels are the Coimbra, Corsair, Jo Linda, and Cylle V. A.

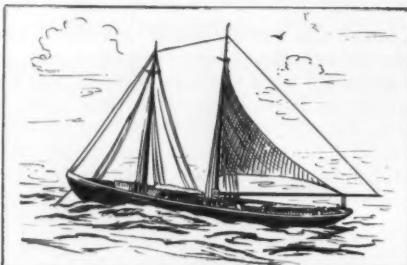
Weather conditions are being reported routinely as the vessels travel to the fishing

grounds. Temperatures for inclusion in monthly temperature charts are derived from those reports. Plans for collection and radio reporting of additional environmental data such as thermocline depth will be made if the communication system works well.

The U. S. Weather Bureau was unable to get radio reports of weather from tuna vessels in the past because they were often required to wait for extended periods before commercial circuits were clear to take traffic. Because of time lost during those waiting periods, particularly on days of heavy fishing activity, the vessels were reluctant to give weather reports. Activation of the tuna vessel radio frequency now eliminates the waiting time and may stimulate cooperation on the part of all vessels.

DOCUMENTATIONS ISSUED AND CANCELED, DECEMBER 1962:

During December 1962, a total of 12 vessels of 5 net tons and over were issued first



Cod-fishing schooner at anchor.

Table 1 - U. S. Fishing Vessels--Documents Issued and Canceled, by Tonnage Groups, December 1962

Gross Tonnage	Issued ² /	Canceled ³ /
.....(Number).....		
5-9	3	5
10-19	3	9
20-29	-	3
30-39	-	1
40-49	4	3
50-69	-	1
70-79	-	1
110-119	1	-
160-169	-	1
250-259	1	-
Total	12	24

¹/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

²/There are no undocumented vessels in December 1962 previously removed from records. Vessels issued first documents as fishing craft were built: 7 in 1962; 1 in 1961; 1 in 1960; 1 in 1956; and 2 prior to 1951. Assigned to areas on the basis of their home ports.

³/Includes vessels reported lost, abandoned; forfeited, sold alien, etc.
Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

Table 2 - U. S. Fishing Vessels¹/--Documentations Issued and Canceled, by Areas, December 1962 with Comparisons

Area (Home Port)	December		Total	
	1962	1961	1962	1961
Issued first documents ² :				
New England	1	1	28	33
Middle Atlantic	1	1	3	12
Chesapeake	2	6	43	75
South Atlantic	1	4	47	47
Gulf	4	6	110	100
Pacific	3	2	130	149
Great Lakes	-	-	5	12
Puerto Rico	-	-	2	2
Total	12	20	368	430
Removed from documentation ³ :				
New England	4	2	24	20
Middle Atlantic	5	3	39	34
Chesapeake	-	-	23	28
South Atlantic	-	-	38	30
Gulf	6	7	104	103
Pacific	8	7	111	112
Great Lakes	1	-	22	14
Hawaii	-	-	3	-
Puerto Rico	-	-	1	-
Total	24	21	365	341

¹/For explanation of footnotes, see table 1.

documents as fishing craft, as compared with 20 in December 1961. There were 24 documents canceled for fishing vessels in December 1962 as compared with 21 in December 1961.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, DECEMBER 1962:

Imports of fresh, frozen, and processed edible fish and shellfish into the United States in December 1962 were down 15.4 percent in quantity and 13.5 percent in value from those of the previous month. There was a general seasonal decline in imports in December. Imports were down substantially for groundfish fillets, frozen tuna other than albacore (decline mostly from Peru), canned tuna in brine, and frozen shrimp (decline mostly from Mexico). The decline was partly offset by an increase in imports of swordfish fillets, frozen albacore tuna, canned sardines not in oil (increase mostly from South Africa), and lobsters from Canada.

Compared with the same month in 1961, the imports in December 1962 were down 1.0 percent in quantity. The value of the imports in both months was the same. There was a sizable increase in the December 1962 imports of groundfish fillets, frozen tuna other than albacore (increase mostly from Japan and British West Africa), and canned sardines not in oil. But imports were down for frozen albacore tuna (decline mostly from Japan), canned tuna in brine, and canned sardines in oil.

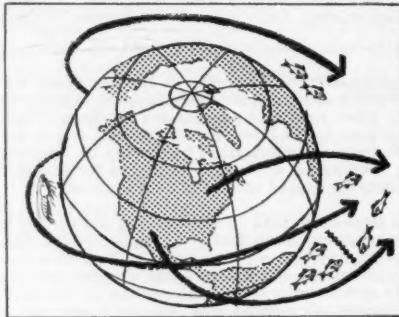
In the year 1962, imports were up 14.0 percent in quantity and 19.1 percent in value as compared to those in 1961. The greater increase in value was because of the higher prices which prevailed in 1962 for most imported fishery products. Most fishery products were imported in greater

quantity in 1962 and imports were up substantially for fish blocks or slabs, frozen tuna (increase mostly from Japan and Peru), canned sardines in oil and not in oil, frozen shrimp, and sea scallops. Imports were down for the following products: haddock fillets, fresh and frozen salmon, canned salmon, canned tuna in brine, canned bonito and yellowtail, and canned crab meat.

Item	Quantity				Value			
	Dec.		Jan.-Dec.		Dec.		Jan.-Dec.	
	1962	1961	1962	1961	1962	1961	1962	1961
Imports:	. (Millions of Lbs.).							
Fish & Shellfish								
Fresh, frozen & processed ¹ . . .	86.5	87.4	1,169.7	1,026.5	31.3	31.3	397.4	33.8
Exports:								
Fish & Shellfish:								
Processed only (excluding fresh & frozen) . . .	4.8	4.6	35.6	28.5	2.1	1.3	16.0	13.4

¹/Includes pastes, sauces, clam chowder and juice, and other specialities.

Exports of processed fish and shellfish from the United States in December 1962 were up 37.1 percent in quantity and 5.0 percent in value from those in the previous month. In December, there was a large increase in exports of the lower-priced canned mackerel and canned sardines not in oil, as well as a modest increase in exports of canned salmon. But there was a decline in exports of canned shrimp.



Compared with the same month in 1961, the exports in December 1962 were up 4.3 percent in quantity and 61.5 percent in value. A sharp increase in exports of the higher-priced canned salmon in December 1962 was almost offset by a decline in exports of the lower-priced canned squid.

Processed fish and shellfish exports for the year 1962 were up 24.9 percent in quantity and 19.4 percent in value from those in 1961. Exports of the lower-priced canned squid (principally to Greece and the Philippines) showed the greatest increase in 1962. Exports were also up for canned mackerel, canned salmon, and canned sardines in oil. But there was a small decline in exports of canned shrimp, (decline mostly in exports to Canada and the United Kingdom) and canned sardines not in oil (decline mostly in exports to the Philippines). Although not covered in the table, exports were up for frozen salmon, and were down for frozen shrimp (decline mostly in exports to Japan) and shucked oysters (principally to Canada).

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1962 at the 12½-percent rate of duty was 59,059,014 pounds (about 2,812,334 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

Imports of tuna canned in brine during January 1-December 31, 1962, amounted to 54,483,996 pounds (about 2,594,476 cases), according to preliminary data compiled by the Bureau of Customs. This was 4,575,018 pounds (217,858 cases) less than the quota. The imports in 1962 were 3.1 percent below the 56,252,179 pounds (2,678,675 cases) imported during January 1-December 30, 1961.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, JANUARY 1963:

Wholesale prices for edible fish and shellfish (fresh, frozen, and canned) in January this year rose 0.8 percent from December 1962 due mainly to higher ex-vessel prices for fresh haddock, and an increase in prices for both fresh and frozen shrimp. Severe weather on the New England fishing banks continued to curtail the groundfish landings at Boston, and new supplies of imported frozen shrimp were held up due to labor trouble on the docks. Compared with the same month last year, prices this January were generally higher for fresh and frozen whole and processed fish and shellfish which more than compensated for a moderate decline in canned fishery products prices.

The drawn, dressed, and whole finfish subgroup index in January 1963 was up 3.1 percent from the preceding month and sharply higher (25.1 percent) from January a year ago. Higher ex-vessel prices for fresh haddock on the Boston market were largely responsible for the increase from December 1962 to January this year. From January a year ago to this January, the drawn haddock price increased by



Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1963 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Jan. 1963	Dec. 1962	Jan. 1963	Dec. 1962	Nov. 1962	Jan. 1962
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					121.9	120.9	118.3	115.2
Fresh & Frozen Fishery Products:					130.0	127.6	123.7	112.4
Drawn, Dressed, or Whole Fish:					137.2	133.1	120.8	109.7
Haddock, Ig., offshore, drawn, fresh	Boston	lb.	.21	.18	162.9	143.8	87.2	78.1
Halibut, West., 20/30 lbs., drsd., fresh or froz.	New York	lb.	.43	.43	128.1	127.1	129.6	110.4
Salmon, King, Ig., & med., drsd., fresh or froz.	New York	lb.	.96	.97	134.5	135.2	134.5	120.5
Whitefish, L., Superior, drawn, fresh	Chicago	lb.	.71	.69	106.0	103.0	100.7	110.5
Yellow pike, L., Michigan & Huron, rnd., fresh	New York	lb.	.54	.54	88.5	88.5	88.5	92.5
Processed, Fresh (Fish & Shellfish):					130.4	128.5	124.0	117.9
Fillets, haddock, sm., skins on, 20-lb. tins	Boston	lb.	.57	.58	137.2	139.6	99.8	87.4
Shrimp, Ig., (26-30 count), headless, fresh	New York	lb.	1.09	1.05	127.2	123.1	121.9	110.2
Oysters, shucked, standards	Norfolk	gal.	7.88	7.88	132.8	132.8	130.7	132.8
Processed, Frozen (Fish & Shellfish):					117.5	116.4	120.7	105.5
Fillets: Flounder, skinless, 1-lb. pkgs.	Boston	lb.	.40	.40	100.1	100.1	103.9	100.1
Haddock, sm., skins on, 1-lb. pkgs.	Boston	lb.	.37	.37	107.0	107.0	107.0	96.7
Ocean perch, Ig., skins on 1-lb. pkgs.	Boston	lb.	.34	.34	117.5	117.5	118.3	115.7
Shrimp, Ig., (26-30 count), brown, 5-lb. pkgs.	Chicago	lb.	1.05	1.03	123.9	122.2	128.7	108.5
Canned Fishery Products:					108.0	109.4	109.4	120.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.75	25.50	107.9	111.1	111.1	122.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.75	11.75	104.4	104.4	104.4	107.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.50	4.50	101.6	101.6	101.6	116.2
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.31	9.31	119.4	119.4	119.4	157.9

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

108.6 percent, frozen dressed halibut rose 16.0 percent, and frozen dressed salmon was up 11.6 percent.

The fresh processed fish and shellfish subgroup index this January increased 1.5 percent from December 1962 and was up 6.0 percent from January a year ago. An increase of 3.3 percent or about 4 cents a pound in fresh shrimp prices at New York City was responsible for the increase in the index from December 1962 to this January. During the same period, prices of fresh haddock fillets at Boston were down slightly and the fresh shucked oyster price was unchanged. As compared with January 1962, haddock fillets this month were higher by 57.0 percent and fresh shrimp prices were up 15.4 percent.

The January 1963 processed frozen fish and shellfish price index rose less than 1 percent from the preceding month because of a 1.4-percent increase in frozen shrimp prices at Chicago. Wholesale prices for frozen fillets

were unchanged from December to January 1963. Compared with the same month a year ago, the January 1963 subgroup index rose 11.4 percent due to higher frozen shrimp prices (up 14.2 percent at Chicago) and an increase in frozen haddock fillet prices (up 10.7 percent at Boston). During the same period, prices for frozen ocean perch fillets increased about 1/2 cent a pound.

From December 1962 to this January the canned fishery products subgroup index declined 1.3 percent because of lower prices for canned pink salmon. The 1962 pack of canned pink salmon was much higher than the previous year and a downward price revision for the year's pack was not unexpected. Compared with January a year ago, the canned pink salmon price index this January was lower by 11.6 percent. Lower prices this January for canned Maine sardines (down 2.4 percent) and other items in the sub-group resulted in a 10.3 percent drop from January a year ago.



As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.



International

EUROPEAN ECONOMIC COMMUNITY

FISHERIES POLICY CONFERENCE POSTPONED:

The European Economic Community (EEC) fisheries policy conference, first scheduled for early in the fall of 1962, and later set tentatively for January 23, 1963, has been rescheduled again, according to a January 3 report from the Brussels correspondent of a large newspaper in Copenhagen, Denmark. The EEC Commission set no new date or place for the conference because of the press of other meetings. It was hoped, however, that the Ministers of Agriculture, under whom fisheries matters come, might agree to hold the conference in late February 1963 in Brussels, Belgium. (Regional Fisheries Attaché for Western Europe, United States Embassy, Copenhagen, January 3, 1963.)

Note: See *Commercial Fisheries Review*, January 1963 p. 65, August 1962 p. 51.

FISH MEAL

WORLD PRODUCTION, NOVEMBER 1962:

World production of fish meal in November 1962 was 19.0 percent greater than in the same month of 1961, ac-

cording to preliminary data from the International Association of Fish Meal Manufacturers. World production during the first 11 months of 1962 was reported as 2,001,902 metric tons.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

World Fish Meal Production by Countries, November 1962

Country	November		Jan.-Nov.
	1962	1961	
.... (Metric Tons)			
Canada	2,193	4,582	67,025
Denmark	4,139	2,639	88,927
France	1,100	1,100	12,100
German Federal Republic	4,803	5,535	66,801
Netherlands	1/ 900		1/ 4,300
Spain	2,055	2,238	23,780
Sweden	709	616	4,467
United Kingdom	5,508	5,150	67,704
United States	9,999	9,135	259,410
Angola	4,375	2,745	29,050
Iceland	1,218	1,539	93,980
Norway	9,131	9,255	116,370
Peru	145,543	114,541	965,181
South Africa (including South-West Africa)	800	1,000	202,807
Total	191,573	160,975	2,001,902

1/Date available only for January-October 1962.

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

The increase in world fish meal production in November 1962 was due mainly to greater output in Peru. World fish meal production during the first 11 months of 1962 was increased by heavier landings of anchoveta in Peru, record landings of pilchards in South Africa, record landings of summer herring in Norway and Iceland, and increased landings of industrial fish in Denmark.

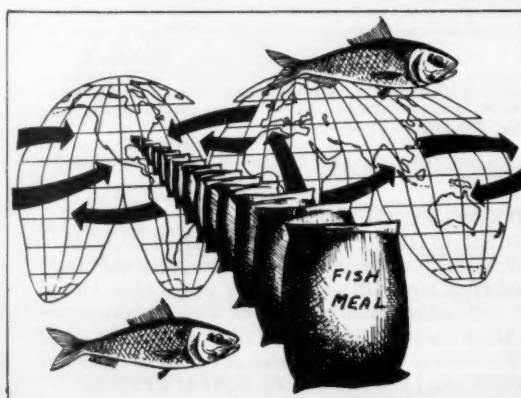
Peru accounted for 76.0 percent of world fish meal production (for countries listed) in November 1962.

During the first 11 months of 1962, Peru accounted for 48.2 percent of total fish meal production, followed by the United States with 13.0 percent and South Africa with 10.1 percent.

* * * * *

FISH MEAL EXPORTS AND PRODUCTION FOR SELECTED COUNTRIES, JANUARY-OCTOBER 1962:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland,



International (Contd.):

Norway, Peru, and South Africa/South-West Africa.

Production and Exports of Fish Meal by Member Countries of the Fish Meal Exporters' Organization, January-October 1962				
Country	October 1962		Jan.-Oct. 1962	
	Production	Exports	Production	Exports
Angola	4,780	4,437	24,666	25,229
Iceland	357	2,421	92,762	59,012
Norway	11,932	6,774	107,239	41,082
Peru	92,353	63,337	819,338	893,865
South Africa (including So.-West Africa)	2,550	10,280	200,419	171,961
Total	111,972	87,249	1,244,424	1,191,149

In January-October 1962, Peru accounted for 75.0 percent of total fish-meal exports by FEO countries, followed by South Africa with 14.4 percent, Iceland with 5.0 percent, Norway with 3.5 percent, and Angola with 2.1 percent. (Regional Fisheries Attaché for Europe, United States Embassy, Copenhagen, January 16, 1963.)

FOOD AND AGRICULTURE ORGANIZATION

ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH MEETS IN ROME:

The new Advisory Committee on Marine Resources Research of the Food and Agriculture Organization (FAO) held its first meeting at FAO's Rome, Italy, headquarters, January 28-February 2, 1963.

The committee reviewed the FAO Fisheries Division's present work in marine resources research and discussed the draft program for 1964/65.

Established in October 1962, the Committee meets once a year and reports its findings to FAO's Director-General.

The Committee is made up of not more than 15 experts from various countries appointed for one-year terms by the Director-General. They have been selected on the basis of their expert knowledge and not as representatives of their governments.

In addition to its FAO role, the Committee will also act as the advisory group on oceanographic aspects of fisheries to the Intergovernmental Oceanographic Commission under the United Nations Education,

Scientific, and Cultural Organization (UNESCO). For this purpose two fisheries scientists from the Soviet Union will be added to the Committee.

Among the 13 members of the Advisory Committee on Marine Resources are two from the United States: Dr. Vernon E. Brock, Laboratory Director, Bureau of Commercial Fisheries Biological Laboratory, U. S. Department of the Interior, Washington, D. C.; and Dr. Wilbert McLeod Chapman, Director, Van Camp Foundation, California.

* * * * *

WORLD TRADE IN FISHERY PRODUCTS REACHES NEW HIGH IN 1961:

International trade in fishery products reached a new high of 4.3 million metric tons and an estimated value of US\$1.3 to 1.4 billion in 1961, according to figures released by the Food and Agriculture Organization (FAO) late in 1962. The 1961 international trade increased by some 250,000 tons and \$50 million over 1960.

About 11.8 million tons of fish as they came out of the water were used to produce the products that entered international trade. That means that one-third of the catch in 1961 for the 127 countries submitting both catch and international trade statistics went into products for international trade. For those same countries, the catch was 35.7 million tons, or 87 percent of the total world catch.

FAO has reported the 1961 world catch at 41.2 million tons. This figure, however, includes FAO's estimate of the catches of countries which did not submit international trade statistics, including mainland China, whose catch alone is estimated at 5 million tons.

Note: A copy of *Yearbook of Fishery Statistics, 1960/61, International Trade*, Vol. XIII, may be obtained from the Sales Agent for FAO Publications, International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y. The price is \$5.00.

INTERNATIONAL LABOR ORGANIZATION

WORKING CONDITIONS IN FISHING INDUSTRY REVIEWED:

Working conditions in the world's fishing industries were discussed by a special 18-man Technical Committee of the International Labor Organization (ILO) at a 10-day meeting at Geneva, Switzerland, that ended December 18, 1962. Fishing vessel crew ac-



International (Contd.):

commodations and safety, accident insurance, vocational training, and certificates of competency were considered at the meeting in order to lay the groundwork for possible international conventions on those subjects. The Committee recommendations to the ILO will later be considered by the International Labor Conference which is the periodic meeting of delegates from 104 nations, including the United States, to discuss world labor problems.

The special Technical Committee has 18 members, six each from labor, management, and government, selected from various member nations of ILO. At the Geneva meeting, Thomas Rice, Assistant to the Commissioner of the U. S. Fish and Wildlife Service, served as a Government representative and Charles Jackson, Legislative Counsel of the National Fisheries Institute, served as an employer representative from the United States.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1963:

Fishing for halibut will begin May 9 (at 6 p.m.) in all North Pacific areas (Areas 1, 2, and 3A) except in Bering Sea (Area 3B North) and waters west of the Shumagin Islands (Area 3B South), according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada for the 1963 fishing season. The regulations this year do not differ substantially from those for 1962.

March 25 will be the opening date for fishing in Area 3B North and April 19 the opening date in Area 3B South. This year fishing will begin on the same dates as last year in all Areas, except Area 3B North. Last year Area 3B North was opened to fishing March 28, three days later than the opening date this year.

Fishing areas shall be: Area 1--south of Willapa Bay, Washington; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North--waters in Bering Sea.

The opening and closing hours of the various regulatory areas shall be 6 p.m. Pacific standard time of the date indicated.

In Area 1 the fishing season, with no catch limit, shall terminate at the same time as that in Area 2. (Last year Area 1 was open to fishing to September 8 or to the date on which Area 2 closed.)

In Area 2 the fishing season shall terminate at the time of attainment of the catch limit of 28 million pounds (the quota is the same as last year and also 1961).

In Area 3A the fishing season shall terminate at the time of attainment of the catch limit of 34 million pounds, which is one million pounds more than last year.

In Area 3B South the fishing season, with no catch limit, shall end September 30 or at the closure of Area 3A, whichever



Dressed halibut are stored in ice in the hold.

ever is the later (the closing date last year was 6 p.m. on September 30).

In Area 3B North the fishing season, with no catch limit, shall end October 15 or at the closure of Area 3A, whichever is later (last year Area 3B North was open to fishing to October 15).

The Commission will provide 10 days notice of closure of Areas 1 and 2, and 18 days notice of the closure of Area 3A as it did in 1962.

The Commission's recommendations for the 1963 season were announced on January 31 at the conclusion of its thirty-ninth annual meeting at Petersburg, Alaska, with Chairman Harold W. Crowther of Washington, D. C., presiding.

Other members of the Commission are Mattias Madsen and William A. Bates, representing the United States; and Dr. William Sprules (Vice Chairman), Harold S. Helland and Richard Nelson, representing Canada.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its specific function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, and its decisions regarding regulation are based upon the findings of its scientific staff.

During the past 31 years of Commission management, there has been progressive improvement of the stocks and increase in annual yield. The annual catch, which had declined to 44 million pounds in 1931 the year before regulation, has averaged 72 million pounds during the past four years. The 1962 catch of nearly 75 million pounds was worth over \$22.5 million ex-vessel. The 1962 catch and value are all-time records.

The Commission reviewed the past year's fishery and the research conducted by its scientific staff. It also dealt with administrative matters and approved a research program for 1963. In the course of its sessions the Commission conferred not only with its staff, but also with representatives of the halibut fishermen's, vessel owners', and dealers' organizations. The scientific findings and all suggestions for regulations in 1963 were discussed at meetings.

The Commission announced also that the 1964 annual meeting will take place at Seattle, Wash. The date was not specified. The annual meeting this year was the first held in Alaska.

Dr. William M. Sprules of Ottawa, Ont., was elected Chairman and Harold E. Crowther of Washington, D. C., Vice Chairman for the ensuing year.

International (Contd.):

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain the 1963 regulations as recommended by the Commission will be approved by the two Governments.

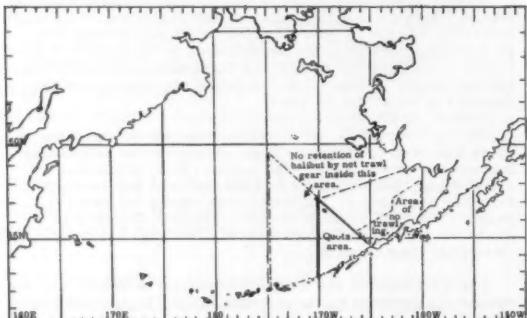
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**CONSERVATION RECOMMENDATIONS
FOR HALIBUT OF EASTERN BERING SEA:**

At its Ninth Annual Meeting, held in Seattle, Wash., in November 1962, the International North Pacific Fisheries Commission determined that the halibut stock of the eastern Bering Sea no longer meets the conditions of Article IV of the International Convention for the High Seas Fisheries of the North Pacific Ocean and recommended to the Contracting Parties that this stock of halibut be removed from the list of stocks under abstention as described in the Annex to the Convention.

At its Ninth Annual Meeting the Commission also agreed to hold an interim meeting in Tokyo, beginning on February 5, 1963, for the purpose of developing recommendations for conservation measures for halibut to be applied to the fisheries of the eastern Bering Sea at such time as the Contracting Parties approve the Commission's recommendation that halibut of the eastern Bering Sea be removed from abstention.

At the interim meeting each national section of the Commission expressed fully its views on necessary and appropriate conservation measures for the stock and area in question. In view of the results of research now available and taking into consideration the fact that the United States and Canada have long taken measures for the conservation of halibut in the eastern Bering Sea on the recommendation of the International Pacific Halibut Commission, the International North Pacific Fisheries Commission respectfully recommends to the governments of the Contracting Parties the following measures for the conservation of halibut in the



eastern Bering Sea. These measures will be required for the purpose of halibut conservation at such time as all the Contracting Parties accept the Commission's recommendation that halibut of the eastern Bering Sea be removed from the Annex to the International Convention for the High Seas Fisheries of the North Pacific Ocean:

1. That the area within which these joint conservation measures shall apply is that portion of the Bering Sea lying east of the meridian of 175° W. longitude.
2. That the period within which these measures shall apply is from 0000 hours on March 25, 1963, to

2400 hours on March 24, 1964. All times mentioned shall be local standard time.

3. That no halibut of length less than 66 centimeters (26 inches), as measured from the tip of the lower jaw to the extreme end of the middle of the tail, or halibut which, with the head off and entrails removed, are less than 2.25 kilos (5 pounds) in weight may be retained at any time by any fishing vessel of any of the Contracting Parties.
4. That nothing within any of these recommendations shall apply to or restrict the operations of a bona-fide research vessel under the direct control of a Contracting Party.
5. That within the joint conservation area the opening date for the retention of halibut by any fishing vessel of any of the Contracting Parties shall be 1800 hours, March 25, 1963.
6. Outside the triangular area as defined in item 7, fishing vessels of any Contracting Party shall not retain any halibut captured after 1800 hours on October 15, 1963, except as stated in item 8 below.
7. That within the triangular area bounded by a line connecting Cape Navarin and the northern tip of Cape Sarichef, Unimak Island; the meridian of 170° W. longitude; and the Aleutian Islands; (a) the catch quota for halibut for the 1963 season shall be 11,000,000 pounds or 5,000 metric tons to be computed with heads off and entrails removed, (b) fishing vessels of any Contracting Party shall not retain any halibut captured after 1800 hours on the date the catch quota has been reached or after 1800 hours on October 15, 1963, whichever is earlier.
8. That, outside of the triangular area defined in item 7 above, linefishing vessels may retain incidentally-caught halibut at a ratio of one pound of halibut for each seven pounds of other species until 1800 hours, November 15, 1963.

9. All vessels employing any type of net trawl gear shall return to the sea immediately any halibut taken within an area bounded by the meridian of 175° W. longitude; the Aleutian Islands and the Alaska Peninsula; a line from Cape Newenham to the intersection of a line from Cape Navarin to the northern tip of Cape Sarichef on Unimak Island with the meridian of 170° W. longitude, and a line from this point to the intersection of the meridian of 175° W. longitude with the line from Cape Navarin to the northern tip of Cape Sarichef on Unimak Island.

The Commission takes note, in relation to the above recommendations for conservation measures in the eastern Bering Sea, that the Government of Japan, as a domestic measure in 1963, intends to prohibit trawling of all kinds in an area defined as follows:

An area delimited by the line of 160° W. longitude; a line connecting the point of 58°10' N. latitude, 160° W. longitude, and the point of 57°10' N. latitude, 163° W. longitude; the line of 163° W. longitude; a line running from the point of 56°20' N. latitude, 163° W. longitude, through the point of 56° N. latitude, 164° W. longitude, to its intersection with a line connecting Cape Navarin of the U.S.S.R. and the northern tip of Cape Sarichef, Unimak Island; a line connecting Cape Navarin and the northern tip of Cape Sarichef; the Aleutian Islands; and the Alaska Peninsula.

This action by Japan will, to a great extent, afford protection for the young juvenile halibut known to be concentrated in the region.

The Commission also notes that, in relation to the above recommendations, the Government of Japan intends to establish

International (Contd.):

lish for 1963 a minimum size limit of 66 centimeters for retention of halibut throughout the Bering Sea.

Further, the Commission records that it is developing a research program to provide information which will extend and improve the scientific basis for the conservation of the groundfish of the Bering Sea.

MARINE OILS

ESTIMATED WORLD PRODUCTION, 1955-63:

World production of marine oils (including whale and sperm-whale oils, and fish and fish-liver oils) in 1963 is expected to be down at least 3 percent from the partially estimated production of 1962. A reduction in whale-oil production is anticipated for the 1962-63 Antarctic season as well as a moderate reduc-

participants from the many countries interested in the fisheries and marine researches of the North Atlantic. Following this, the Commission received and accepted an invitation from the Food and Agriculture Organization (FAO) to hold the Symposium at its headquarters in Rome. The time for the Symposium has now been fixed for January 27 to February 1, 1964. The planning of the Symposium is already far advanced. More than 60 contributions have been promised, and it is hoped that the contributors will be able to submit their papers well in advance of the Symposium in order that they can be circulated and studied before the Symposium to ensure the most complete consideration and discussion of them during the Symposium.

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Type	Estimated World Production of Marine Oils, 1955-1963								
	1/1963	2/1962	3/1961	3/1960	3/1959	3/1958	3/1957	3/1956	3/1955
Whale	330	395	428	418	417	435	440	425	420
Sperm whale	115	126	120	122	130	135	110	120	100
Fish (including liver)	760	720	667	514	476	384	385	457	443
Total	1,205	1,241	1,215	1,054	1,023	954	935	1,002	963

1/Forecast.

2/Partially estimated.

3/Revised.

tion in output from whaling areas outside the Antarctic. The reduction in whale-oil output is expected to more than offset the anticipated increase in fish-oil production, principally by Peru, Chile, and perhaps South Africa. (Foreign Crops and Markets, Statistical Supplement, January 31, 1963, U. S. Department of Agriculture.

Note: Data completely revised from that published in Commercial Fisheries Review, January 1963, p. 66. Revision due to new method of compiling data by U. S. Department of Agriculture for years 1955-1963.

NORTHWEST ATLANTIC FISHERIES COMMISSION

ENVIRONMENTAL SYMPOSIUM PLANNED FOR 1964:

This Symposium, the main subject of which is to consider the influence of the environment on the groundfish stocks in the North Atlantic, was originally scheduled to take place in connection with Commission's 13th Annual Meeting in May-June, 1963, in Halifax, Canada. Later it was decided to postpone the Symposium until January 1964, and further to hold it in a place as easily accessible as possible for



THIRTEENTH ANNUAL MEETING SCHEDULED:

The Commission's 13th Annual Meeting is scheduled to take place in Halifax, Canada, May 22-June 8, 1963.

In advance of the meeting the scientific advisers to Panel 5 will meet at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me., to review research on herring and environmental studies and to develop programs of research. This meeting will take place May 8-22.

The meetings to take place in Halifax are scheduled as follows: (1) meeting of the Assessment Group, May 22-25; (2) meetings of the Standing Committee on Research and Statistics and of Groups of Advisers to Panels, May 27-June 1; and (3) Annual Meeting proper, June 3-8.

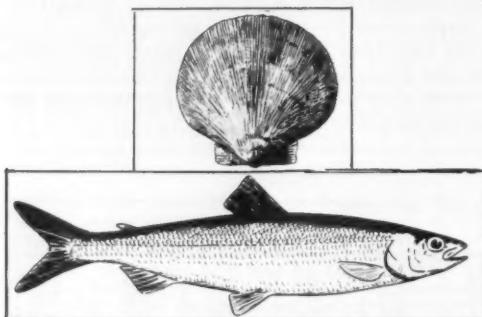
The meetings (1) and (2) will be held in rooms placed at disposal by the Dalhousie University; the Annual Meeting proper will be convened in the Nova Scotian Hotel in Halifax.

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International (Contd.):

MID-1962 MEETING OF
COMMISSION SCIENTISTS:

This meeting was held at the Biological Station, St. Andrews, N.B., Canada. In the meeting participated a number of scientists working with Commission problems from the Biological Stations in St. Andrews, N.B., Boothbay Harbor, Me., and Woods Hole, Mass., and a representative from the Com-



Scallop and herring studies discussed.

mission Secretariat. The main subjects for the meeting were environmental conditions, herring, scallop, and groundfish. Results of work carried out during the preceding year were compared and considered, and plans for future work were elaborated.

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AGING TECHNIQUES WORKSHOP HELD:

At this meeting, held in Bergen, Norway, in November 1962, a number of experts directly concerned with the reading of otoliths for age-determination participated in the Workshop. The workshop dealt with the techniques of preparing otoliths for reading and in the main with certain difficulties encountered when reading the otoliths. A number of recommendations were passed aimed at achieving a complete comparability of otolith-readings, at furthering the exchange of otoliths between countries, and at securing the proper procedure for sampling for age-determinations.

The Subcommittee on Aging Techniques, at the 1961 Annual Meeting, regarded it as very valuable if the Secretariat would approach the International Pacific Halibut Commission requesting its cooperation in the Commission's halibut otolith exchange program. The Halibut Commission has cooperated in the reading of samples of halibut

otoliths submitted by Canada, Denmark, and Iceland and has now submitted two samples of Pacific halibut which are to be circulated to the three member countries participating in the exchange program.

TRADE FAIRS

WORLD FISHING EXHIBITION TO BE HELD
IN LONDON, ENGLAND, MAY 27-31, 1963:

An international display of the latest developments in commercial fishing equipment will be shown at the World Fishing Exhibition to be held at Earls Court, London, England, May 27-31, 1963. Marine engines and auxiliary equipment, nets, fishing gear, marine electronics, and fishing vessel designs will be shown by exhibitors from at least 14 major manufacturing countries. A large display area will be devoted to fully rigged models of the latest midwater, off-the-bottom, and variable-depth trawls. The entire Exhibition will occupy 100,000 square feet of Earls Court.



The Exhibition is sponsored by leading fishermen's organizations in the United Kingdom, as well as by the London Chamber of Commerce, the World Fishing Magazine, the British White Fish Authority, and the Herring Industry Board.

The Exhibition will be open only to those engaged in the fishing industry, and those manufacturers, scientists, and technicians serving their needs. For ticket applications, contact the Exhibition Manager, Commercial Exhibitions, Ltd., St. Richards House, Eversholt St., London, NW1, England.



Australia

FISH AND SHELLFISH LANDINGS
AND VALUE, 1960/61 AND 1961/62:

During the Australian fiscal year ending June 30, 1962, landings of fish and shellfish rose 7.1 percent in volume and 9.6 percent in value as compared with the preceding fiscal year. Landings of finfish in fiscal 1961/62 of 78.7 million pounds were the highest since 1948/49. This plus a record shrimp catch of 9.3 million pounds was largely responsible for the 11.1 percent increase in over-all land-

Australia (Contd.):

ings in 1961/62 over the preceding fiscal year. The 1961/62 landings of spiny lobsters (whole) of 28.8 million pounds valued at US\$12.7 million were up 4.8 percent in weight and 16.1 percent in value from a year earlier. The increase in the value of the spiny lobster landings in this past fiscal year was due primarily to higher prices paid for the frozen lobster tails exported to the United States.

FUNDS ALLOCATED FOR SURVEY OF SPERM WHALE RESOURCE:

The Australian Commonwealth Government has allocated £12,000 (US\$26,880) for each of the years 1963 and 1964 from the Fisheries Development Trust Account for a survey of the sperm whale resource off the Western Australian coast. The survey, to be conducted by the Commonwealth Scientific and Industrial Research Organization, will involve aerial spotting of sperm whales between

Table 1 - Australia's Fisheries Landings^{1/} and Values, 1960/61 and 1961/62^{2/}

Species	3/1961/62			3/1960/61		
	1,000 Lbs.	£1,000	US\$1,000	1,000 Lbs.	£1,000	US\$1,000
Finfish	78,668	5,955	13,387	70,826	5,907	13,279
Spiny lobster	28,813	5,660	12,724	27,494	4,877	10,963
Shrimp	9,322	1,341	3,015	6,529	961	2,160
Crabs	875	79	178	787	68	153
Oysters	12,613	1,014	2,279	14,220	918	2,064
Scallops	5,172	155	348	6,896	237	533
Other shellfish	1,025	45	101	692	31	70
Total	136,488	3/14,249	3/32,032	127,444	3/12,999	3/29,222

^{1/}Landed weight.^{2/}Preliminary data.^{3/}Exclusive of Queensland's fresh-water fish catch.

Note: Australian pounds converted to US\$ at rate of £1 equals US\$2.240.

Table 2 - Landings by Australian States,^{1/} 1960/61 and 1961/62

Species	Queensland		New South Wales		Victoria		South Australia		Western Australia		Tasmania	
	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61	1961/62	1960/61
(1,000 Pounds)												
Finfish	8,834	6,892	27,071	28,260	11,995	11,444	15,059	12,735	9,300	7,596	6,182	3,503
Spiny lobster	54	41	398	476	1,134	1,266	4,025	3,721	19,238	18,019	3,964	3,971
Shrimp	4,400	3,500	4,678	2,916	4	7	-	-	239	106	-	-
Crabs	625	595	190	144	-	-	-	-	59	48	-	-
Oysters	323	242	12,204	13,296	65	162	-	-	10	515	1	5
Scallops	400	1,600	-	-	-	-	-	-	-	-	4,772	5,296
Other shellfish	117	67	-	-	894	557	-	-	14	68	-	-
Total	14,753	12,937	44,541	45,092	14,092	13,436	19,084	16,456	28,860	26,352	14,919	12,775

^{1/}Exclusive of about 239,000 pounds in 1961/62 and 396,000 pounds in 1960/61 landed in Australia's Northern Territory.^{2/}Exclusive of fresh-water fish caught in Queensland.

Australian 1961/62 landings as compared to the preceding fiscal year by States were marked by sharp increases in landings of shrimp in New South Wales (up 60.0 percent) and in Queensland (up 31.0 percent). The higher landings of finfish this past fiscal year over 1960/61 were due partly to record tuna landings in South Australia, increased mullet landings in Queensland, and an excellent salmon-trout season in Western Australia. The 25.0 percent decrease in landings of scallops during 1961/62 was due mainly to a sharp drop (75.0 percent) in the landings in Queensland. The Queensland scallop fishermen in 1961/62 diverted some of their fishing effort to the more lucrative shrimp fishery.

Albany and Shark Bay, and will be augmented by spotting carried out by two private whaling companies. (United States Embassy, Canberra, January 11, 1963.)

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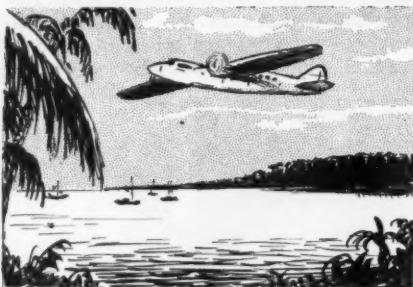
TUNA SURVEY OFF WESTERN AUSTRALIA:

A total of £40,000 (US\$89,600) has been spent for a survey of the commercial potential of tuna off southwest Western Australia. Australia's leading tuna fisherman commanded the chartered tuna clipper *Estelle Star* to carry out the work. Despite abnormally bad weather conditions, the survey, which started on July 31, 1961, achieved good coverage of the area.

* * * * *

Australia (Contd.):

During the closing stages of the survey, approval was given for the expenditure of up to £2,500 (\$5,600) for the charter of a suitable airplane to help in the exploratory operations. A twin-engined aircraft was



chartered from a Perth firm and 22 flights were carried out during May, June, and early July 1961.

The Estelle Star trolled for tuna continuously while at sea, and used the pole-and-lure-bait method of fishing when suitable schools of tuna were found. An experimental long line provided by CSIRO was shot on six occasions.

The immediate conclusion of the survey is that tuna fishing on a commercial scale could not have been maintained during the 12 months the Estelle Star worked in the area. This conclusion is not equivalent to saying that a tuna fishery cannot be established, since the year may have been abnormal in some fundamental respects. Weather, for instance, was reported as "abnormally bad," but the basic reason for low catches seems to have been a scarcity of fish of the size required by the canner.

During the whole of the period of the survey, a CSIRO officer was on board Estelle Star and a great deal of valuable scientific information was obtained. More than 5,000 small tuna were measured and tagged, and over 1,000 observations made of the environmental conditions, including temperature and salinity. The tagging program particularly is of great value for the study of the distribution and migration of tuna around Australia. (Australian Fisheries Newsletter, November 1962.)



Brazil

ERADICATION OF PIRANHA
IN INLAND WATERS:

A small news item, "Piranhas a Problem in Brazil's Inland Waters" (Commercial Fisheries Review, January 1962 p. 9), has prompted a Brazilian Government biologist to write the following article in clarification of the piranha problem in Brazil

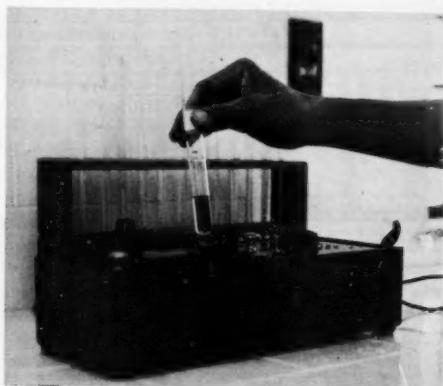


Fig. 1 - Determining the content of rotenone in a sample of timbo powder by the colorimetric-photoelectric process.

The results of the Brazilian Government's fight against the piranha (Serrasalmus) are tangible and compensating, and the cost relatively low.

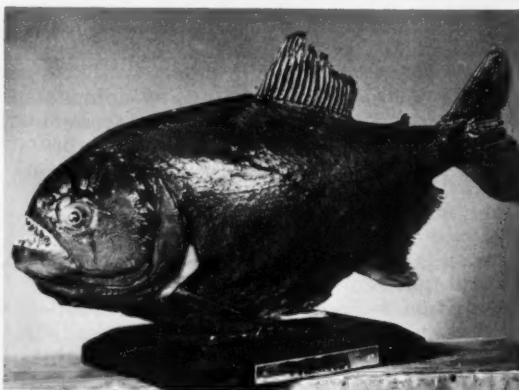


Fig. 2 - A specimen of piranha (Serrasalmus) measuring 14 inches in length, from the Jaguaribe River.

At the request of the Service de Piscicultura (Pisciculture Service) of the National Department of Works Against the Droughts

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 671

Brazil (Contd.):

("Departamento Nacional de Obras Contra as Secas"), from 1957 to 1961, with the cooperation of the biologists of our agency, we intensified the fight against the piranha and succeeded in exterminating that harmful species in 10 dams, with a total hydrographic basin area of 18,532.8 square miles in the northeastern region of Brazil known as the "Drought Polygon."



Fig. 3 - A close-up of a piranha's head, showing the teeth.

In the state of Ceara alone, its two largest hydrographic basins are infested with piranhas: Jaguaribe River (28,957.5 square miles) and Acarau River (15,354.7 square miles). In those areas, great losses are inflicted upon cattle and men, particularly those who fish for a living. Small scars, but also mutilations and even loss of lives are traceable to the awesome piranha.

The above rivers flow only in the rainy season, but the small lagoons remaining in their beds for the dry season present a serious danger for the livestock, as they are teeming with piranhas.

The dams constructed in those hydrographic basins become real piranha ponds, precluding people from taking advantage of them as a fishing source. Extensive damage is caused to fishing gear by the fish, and fishing is avoided because of its dangers.

The biologists of the Pisciculture Service carried out tests with "timbo" powder



Fig. 4 - The wound inflicted on a 16-year-old boy attacked by a piranha in the "Riacho dos Cavalos" Dam, Paraiba State. The photo was taken five minutes after the accident.



Fig. 5 - Fisherman in the "Riacho do Sangue" Dam, Ceara State, shows a mutilated little finger caused by a piranha attack.

Brazil (Contd.):

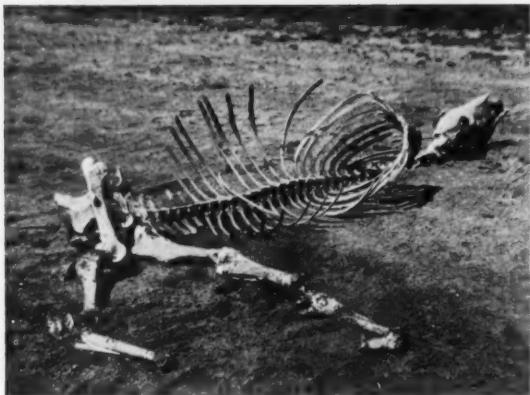


Fig. 6 - Remains of the skeleton of a horse eaten up by piranhas in "Santo Antonio de Russas" Dam, Ceara State.

and found that piranha is the regional species most sensitive to the action of the rotenone it contains (6 percent).



Fig. 7 - Workers handling timbo powder are protected by face masks.

The powder is obtained in the Amazon by grinding the roots of certain plants of the Sapindaceae, Leguminosae, Euphorbiaceae family, popularly known as "timbo."

The tests with the powder were made by applying it to the water at the rate of 3 parts per million (p.p.m.). It eliminated the piranha (egg, larvae, young, and adult) within 11 to 15 minutes, with little damage to the young, fingerlings, and adults of all the other regional species.

Work plans were made and carried out in the dry seasons. While the engineers were building the dams, the biologists were search-

ing the upstream hydrographic basin, "poisoning" ("tin guijando") all the bodies of water, making a real selective eradication of the piranha.



Fig. 8 - Workers in canoes spraying timbo powder in deep waters.

"Oros" Dam is the largest basin where this work has been done. Its area totals 9,652.5 square miles. The "Oros" Dam was built on the Jaguaribe River, in the State of Ceara, and can impound 141,262,400,000 cubic feet of water, absolutely free from piranhas.



Fig. 9 - In deeper places, timbo paste is being applied with the aid of a funnel to which a rubber tube is attached.

Upstream from the "Oros" Dam, in the Jaguaribe River, an already existing dam called "Varzea do Boi" (1,833,232,796 cubic feet) was "poisoned." For economy sake, and also for increased efficiency, its volume was reduced to 42,378,720 cubic feet before the operation began. In that reservoir 3.5 metric tons of "timbo" powder were used, and 150 men and 40 boats employed to apply the ichthyotoxic substance.

Brazil (Contd.):

Thousands of piranhas died in the three days the work was carried out. After 72 hours, 60 dynamite charges were blasted off in many places of the dam. Specimens of seven different species were collected be-



Fig. 10 - Specimen of a piranha killed by timbo powder.

longing to the Cichlidae, Loricariidae, Characidae, Pimelodidae, and Poecilidae families, which shows the selective character of the process used to eradicate piranhas. A larger volume of water than the above, the largest ever successfully "poisoned," was the "Poco da Cruz" Dam, in the State of Pernambuco, in the Moxoto River basin of the Sao Francisco River, soon after its completion, when 60,044,000 cubic feet of water were impounded. Four metric tons of "timbo" powder were applied there in October 1957. The dam now holds 17,660,000,000 cubic feet, and not a single specimen of piranha has been reported so far, despite intensive fishing, which is proof of the efficacy of the poison.

To avoid the piranha plague in the "Araras" Dam (35,315,600,000 cubic ft.) in the Acarau River, a complete eradication program was carried out in its basin, an area of 1,351.3 square miles. While the engineers were building the dam, our biologists were working upstream.

The work was done in 113 days (October 27, 1957, to February 2, 1958). The expedition traveled 621.4 miles along the bed of 3 rivers and 67 creeks. "Poisoning" was done on 758 "pocos" (depressions in the bed of the river where water remains most of the dry season), 46 drinking places, 3 dams, and 1



Fig. 11 - Piranha (*Serrasalmus*) killed by timbo powder.

lagoon; test blasts with dynamite were made on 34 "pocos," 129 dams, 13 drinking places, and 6 lagoons; piranhas were found and eradicated in 48 "pocos" and 1 lagoon. A total of 4.5 metric tons of "timbo" powder was used.

The total cost of the work was Cr.\$1,531,255 (US\$9,754), including personnel and supplies for the complete eradication of the "Araras" Dam and its whole hydrographic basin.

In fishing licenses alone, from January 1961 to May 1962, in the "Araras" Dam, the Federal Government collected from fishermen Cr.\$4,625,548 (\$29,465). Accurate statistics for the same period show a production of 3,323 metric tons of fish, worth Cr.\$80,855,051 (\$515,047). Such work can never be deemed as costly, especially considering that the "Estevam Marinho" Dam, formerly "Curema" (48,029,216,000 cubic ft., therefore larger than the "Araras") collected in the same pe-

Brazil (Contd.):

riod only Cr.\$2,018,788 (\$12,860) in fishing licenses and yielded only 1,366 tons of fish worth Cr.\$45,273,525 (\$288,392) because fishing was severely curtailed by the presence of piranha.

Even if the economic results obtained from fishing were not so high, the sole advantage of freeing the livestock and the people of the region from the carnivorous piranha would justify the cost of the work.



Fig. 12 - "Escama Peixe" (Fish Barrier) built in a drainage ditch to prevent entry of piranhas.

As the piranha does not leap or jump, and to prevent downstream specimens from returning to already "cleaned" dams, a special barrier, regionally called "Escama Peixe," is built in the spillway. Ceara is the North-



Fig. 13 - Two fishermen with a 200 x 3 meter nylon net caught 102 kilograms (224 pounds) of fish during a night's fishing in "Araras" Dam, Ceara State, thanks to the extermination of piranhas, formerly performed in that dam.

eastern state which benefited most from the piranha eradication work, as that species has been exterminated in the basins of the Jaguari- be and Acaraú Rivers, an area of 16,861,913.6 square miles, which amounts to 29.6 percent of the total State area.

In view of the remarkable results achieved, the Pisciculture Service intends to resume the piranha eradication work in the inland waters of the "Drought Polygon" of Northeastern Brazil.

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--Oscar Fontenele, Biologist,
Pisciculture Service, National
Department of Works Against Droughts,
Brazil.

Note: Values converted at rate of 156.87 cruzeiros equal US\$1.



Canada

ARCTIC CHAR FROM FAR NORTH WIDELY DISTRIBUTED:

Providing a way can be found to spread small fishing operations over a large area of northern Canada, there seems to be a promising future for the Arctic char. This widely distributed species from the Far North is rapidly becoming a favorite item on hotel and restaurant menus in both Canada and the United States. It is also gaining popularity as a sport fish for anglers who like to travel far and explore new territory. In addition, the Eskimos have found it a new source of livelihood.

Scientists of the Fisheries Research Board of Canada have found Arctic char practically everywhere in the Arctic Archipelago. Last summer they made an extensive survey, mainly on fish and biological oceanography, and on marine mammals where possible, in the Canadian Arctic islands. A report submitted at the Board's annual meeting in Ottawa in January this year told of the extent of the survey.

A coordinating base was established at Cambridge Bay on Victoria Island, Northwest Territories, and four stationary camps were established at Eureka on Ellesmere Island, Assistance Bay on Cornwallis Island, Cresswell Bay on Somerset Island; and at the mouth of the Thomsen River on Banks Island. All those islands are in the Arctic Ocean.

From those camps visits were made to Axel Heiberg Island, Grinnell Peninsula on Devon Island, Prince of Wales Strait, and lakes on several of the larger islands.

In addition to both landlocked and anadromous Arctic char, the scientists found lake herring, lake trout, and whitefish farther north than had been considered the normal range of these species. (Canadian Department of Fisheries, January 7, 1963.)

* * * * *

BASIC RESEARCH ON FISH FLAVORS MAY LEAD TO NEW PRODUCTS:

Baked halibut that tasted and smelled like baked king spring salmon was prepared at Canada's Vancouver Fishery Technological Station during 1962. This was reported at the annual meeting of the Fisheries Research Board of Canada in Ottawa on January 5, 1963.

The new product with the switch in flavor was not prepared to fool the taste buds or to make halibut palatable for that choice fish has few taste superiors. Rather it was a blend of halibut, king salmon oils, and water prepared by the Board's scientists who are seeking to understand the phenomena of fish flavor. During this year, the studies are being concentrated upon the flavors of baked king salmon and Pacific oyster.

This basic research program may be expected to broaden considerably in the future. As new techniques are developed and perfected, scientists will be able to make appraisals of fish flavors that are impossible at the moment. (Department of Fisheries, Ottawa, Jan. 5, 1963.)

* * * * *

BRITISH COLUMBIA

SHUCKED OYSTER PRODUCTION, 1962:

Preliminary data on British Columbia's production of shucked oysters in 1962 shows an increase of about 11 percent as compared with 1961 and up 28 percent from the 78,395 Imperial gallons produced in 1960.

British Columbia Oyster Meats Production, 1961-62		
Liquid Measure	1/1962	2/1961
Half-pints	411,235	353,931
Pints	20,503	23,363
Quarts	75,462	38,379
Gallons	50,061	45,602
Total in Imperial Gallons	100,343	90,372

1/Preliminary.
2/Revised.

Prices to producers for shucked oysters in December 1962 were as follows for Imperial measures: half-pints, C\$0.30-0.40; pints, \$0.60-0.75; quarts, \$1.00-1.65, and gallons, \$3.25-5.25. In December 1961 the price for Imperial gallons was \$3.15-5.25, and in December 1960 it was \$3.00-5.25.

The retail price of shucked oysters in Vancouver on January 15, 1963, for an Imperial half-pint was 50-55 Canadian cents or unchanged from the retail level on the same date of 1962.

Note: See Commercial Fisheries Review, March 1962 p. 35.

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CONTRACT LET FOR NEW

NEWFOUNDLAND BAIT SERVICE VESSEL:

Contract for the construction of a new 165-foot freezer-bait vessel for Newfoundland was

Canada (Contd.):

announced on January 15, 1963, by Canada's Fisheries Minister. The vessel, which will cost C\$1,415,380, will be built by a Province of Quebec shipbuilding firm.

The new vessel will play a prominent part in the Department's Newfoundland bait service program. It will be capable of freezing bait fish (such as squid, herring, and caplin) at point of capture and will be used to transfer frozen bait stocks from areas of surplus to areas of shortage. The vessel will transport bait to bait depots and holding units located in some 50 fishing settlements around the coast of Newfoundland. When completed it will replace the M/V *Arctica*, which has provided yeoman service for the Province's fishermen for over 25 years.

Of welded-steel construction and aluminum superstructure, the new vessel will be strengthened for navigation in ice. It will have a holding capacity of 190 tons and its freezers will be capable of freezing about 15,000 pounds of bait in 18 hours. Modern principles of shipboard freezing will be employed and the bait will be frozen in blocks of uniform weight for storage in cardboard cartons.

A single-screw, Diesel-engined craft, the vessel is designed in accordance with the latest requirements of the Canadian Steamship Inspection Service. It is expected to have a cruising speed of 12 knots, and in addition to its bait supply services, it will assist other Departmental vessels in the Newfoundland area in patrol duties. When necessary it will also take part in search and rescue operations.

The replacement of the M/V *Arctica*, probably late in 1963 or early 1964, with this modern refrigerated vessel represents a further step in Canada's program of extending and modernizing the bait service. Over the past several years 28 bait-holding units have been added to the original 20 depots taken over at the time of Union and in addition three refrigerated trucks have been put into service to transfer bait between cold storages in those areas where road facilities exist.

Note: See Commercial Fisheries Review, November 1962 p. 59.

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FISH PROTEIN CONCENTRATE
EXPERIMENTS ENCOURAGING:

The production of fish protein concentrate or fish flour from less expensive and easily available fish is being studied by technologists of the Fisheries Research Board of Canada. A report on this project was given at the Board's annual meeting in Ottawa early in January this year by scientists of the Board's research station in Halifax.

Recently a scientific team at that station produced a superior quality fish flour from cod fillets. This was done because of the interest of the Food and Agriculture Organization (FAO) in a product that would pass its rigid specifications. Preliminary reports on nutrition tests now being carried out by the Department of National Health and Welfare, the National Research Council, and the U. S. Bureau of Commercial Fisheries show it to be of excellent quality.

With the completion of this project, the Board's technologists are now producing a fish protein concentrate from cheaper fish. At present, work is continuing on the use of cod trimmings (not the head and viscera), non-oily fish, and oily species such as herring. Initial results show that non-oily starting material can be used to yield a fish flour of only slightly different appearance from the concentrate produced from cod fillets, but retaining the same nutritive qualities.

The development of fish flour is not new. It started as a postwar effort by FAO and was undertaken by many of the world's leading fisheries research laboratories, including the Halifax Station. The program was prompted by a desire to supply underdeveloped nations with a cheap supply of animal protein.

In addition, dietetic studies in Canada and the United States showed a need for additional proteins in some diet formulations, especially for people engaged in heavy manual work, postoperative patients, and elderly people. One of the simplest uses of the product would be as an additive to bread, cereals, and other foodstuffs where protein supplementation could be advantageous. Experimental work in this field is being carried out by the Consumer Branch of the Department of Fisheries of Canada.

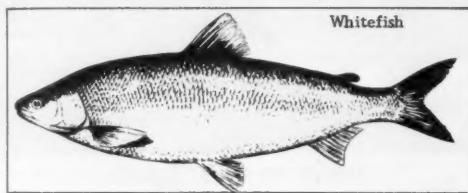
Canada (Contd.):

For all practical purposes properly prepared fish flour is tasteless and odorless. It is about 90 percent protein and of high nutritive value.

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FISH SAUSAGE MADE FROM WHITEFISH:

As part of Canada's policy of creating greater potential markets for fishery products, technologists of the Fisheries Research Board of Canada have developed a fish sausage made from fresh-water whitefish. The new product is similar in texture



to that of the more familiar pork product. A report on the project was given on January 5, 1963, at the Board's annual meeting in Ottawa.

The formula for the fish sausage resembles that of the pork product. Fish fillets are minced to a pulp in a grinder and are blended with precise amounts of fat, spices, and water. At first, cereal was used as a binder, but later this was discontinued as it was found that its absence did not affect the texture, consistency, and flavor of the product. Tests showed that the texture of the product was affected by the sequence of ingredients added in the mixing operation, by the temperature during the mixing process, and by the time consumed in the mixing operation.

Important assistance was given to the scientists by the appearance on the market of a new type of homogenizer or mixer. In the early stages of the project, the presence of bones in the ground-up fish had created problems. With the new homogenizer the small bones are reduced to a thin paste. (Department of Fisheries, Ottawa, January 5, 1963.)

Note: See Commercial Fisheries Review, September 1962 p. 66.

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FISHERY RESEARCH AIDED BY UNDERWATER OBSERVATIONS IN 1962:

The past year has seen an increased interest in underwater exploration by the staff at the St. Andrews, New Brunswick, Biological Station of the Fisheries Research Board of Canada. Not content with remaining at the surface without seeing directly what went on below, scientists and technicians alike have been actively seeking information on the bottom of the sea. The fields of this research have been quite varied; for example, one member of the St. Andrews team spent several weeks in the Arctic, assisting in the study of the distribution of marine arctic species.

In the Bay of Chaleur, divers mapped the areas where herring had spawned, and from their counts of the eggs, deduced how many herring there were in that part of the ocean and what percentage had been caught by local fishermen. They estimated that about 185 million fish, weighing 54.7 million pounds, had contributed to the spawning and of those 2.2 million pounds or four percent had actually been caught.

Lobsters have been studied, more to learn about the animal itself rather than about the fishery. Divers have seen how small lobsters are caught, or perhaps not caught, by special drags used to estimate the lobster population. They have also seen how lobsters hide under rocks and stones during the daytime, and how quickly they will move into drainage tile "houses" provided for them on the sea bed.

Of specific interest to the scallop fishery was the assessment of the efficiency of scallop drags by the divers. Members of the team took turns in riding on the drag as it was towed over the sea bed and counted the scallops that swam out from its path. They also followed the path of the drag picking up scallops the drag had missed. Finally they cleared a large measured area of scallops and brought them ashore for measuring so that the scallop population of the area could be assessed. From these sorts of observations it is hoped that in time more efficient ways of fishing scallops may be devised.

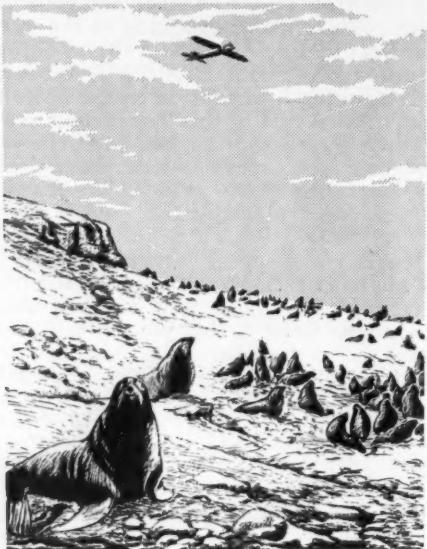
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SCIENTISTS REPORT ON FUR SEAL INVESTIGATIONS:

Scientists of Canada's Fisheries Research Board have completed five years of investigations of fur seals in cooperation with Japan,

Canada (Contd.):

the United States, and the Soviet Union, under the terms of the Interim Convention on Conservation of North Pacific Fur Seals.

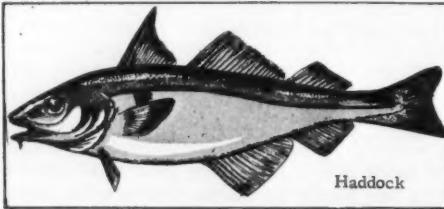


The fur seals were collected for study in Hecate Strait and the northern mainland inlets of British Columbia, the west coast of Vancouver Island, and in the Gulf of Alaska during 1962. A research vessel took 501 from total sightings of approximately 2,000. Nineteen tagged seals of Pribilof origin were recovered, according to a January 4, 1963, report on fur seals given at the Board's annual meeting in Ottawa.

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GROUNDFISH RESEARCH REVIEWED AT 1962 ANNUAL MEETING OF SCIENTISTS:

Haddock: The haddock fishery on the Newfoundland Grand Bank, which has been highly productive in recent years, is tapering off rapidly as stocks have become de-



pleted, biologists of Canada's Fisheries Board reported on January 5, 1963. No new year-classes of commercial importance have appeared since 1955 and 1956 and the fishery for that species has been intensified by the entry of the Russian fleet in 1960.

The haddock investigations also took in the St. Pierre Bank. Here the Board's research vessel A. T. Cameron found the species in

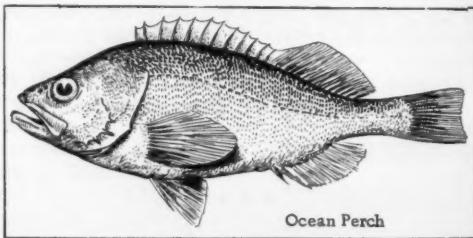


Research vessel A. T. Cameron.

short supply. At two stations small quantities of baby haddock were caught but it is too soon to say whether or not the small haddock are sufficiently abundant to sustain a fishery in the future. Past surveys have indicated, however, that patchy concentrations have never really produced very successful year-classes.

There has been no significant commercial fishery for haddock on the St. Pierre Bank since 1956.

Ocean Perch: In the past four years practically all the possible ocean perch trawling grounds in the Northwest Atlantic from Southern Nova Scotia to the Arctic have been surveyed by the staff of the St. John's, Newfoundland, Biological Station. This comprehensive survey, which covered the entire depth range of the ocean perch, extending down to 400 fathoms, was carried out by the A. T. Cameron.

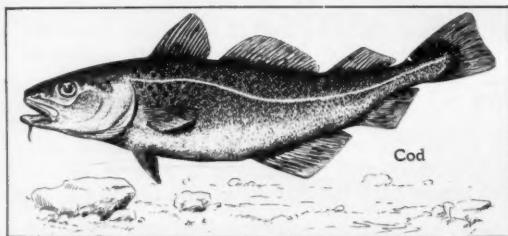


Canada (Contd.):

The purpose of the investigations has been to assess the magnitude of present stocks of ocean perch and the extent of the potential fishing grounds. Background biological information has also been collected on such things as growth, movements, feeding, and reproduction. This is used in the formulation of plans for obtaining maximum sustained yield from this valuable marine resource by rational exploitation.

Sea Dab: Another report was about American plaice or sea dabs which, it was found, grow faster on the southern half of the Newfoundland Grand Bank than on the northern half of the great underwater shelf.

Cod: Tagging was carried out in 1962 for the first time since 1954-55, when 19,000 cod were tagged in Newfoundland inshore and bank areas. The purpose of the present pro-



gram, in which 10,000 fish have been tagged, is to show what changes have occurred in the cod stocks and what intermingling takes place of the populations both inshore and offshore.

* * * * *

LAMPREY POPULATION CONTROL IN LAKE SUPERIOR:

There is now concrete evidence of the possibility that the lamprey population of Lake Superior can be controlled. This encouraging information was contained in a report released on January 4, 1963, at the annual meeting in Ottawa of the Fisheries Research Board of Canada. The report also pointed out that the predator, which has played havoc with the valuable fish stocks of the Great Lakes, can only be checked fully through a stepped-up control program.

The report, presented by the Board's London, Ont., Biological Station, noted that the lamprey population in Lake Superior has been reduced greatly. This was indicated by



Electric barriers control sea lamprey spawning.

lamprey counts taken in 1962 at electrical barriers placed on streams tributary to the Lake. The barriers prevent the adult lamprey from ascending the streams to spawn.

The Board is responsible for much of Canada's share of the scientific investigations of the lamprey problem, under an agreement with the Great Lakes Fishery Commission (Canada and United States).

The smaller numbers of lamprey found in the Lake in 1962 are due undoubtedly to the scientifically developed control measures employed, the report stated. At the present time a lampricide, a specific toxicant, is used against the predators while they are in the larval stage, during which most of them live in burrows in the beds of streams where they are hatched.

The electrical barriers also may have contributed to the reduced populations. Although a small number of lamprey have managed to slip by the barriers and reached upstream spawning grounds, nevertheless there can be little doubt that they have prevented the major part of recent runs from spawning.

Despite the progress that scientists have made in unravelling the lamprey problem, there is still a great need for biological knowledge concerning its characteristics and life-history. Consideration must be given also to the matter of lamprey larvae populations in Lake Superior itself. The larvae, always thought of in the past as stream dwellers only, were found in fairly substantial numbers in the open Lake between 1960 and 1962.

Canada (Contd.):

Although it is impossible to estimate their numbers, the report suggests that they constitute enough of a menace to fish stocks to warrant being included in lamprey control plans.

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NEW BARGE TO SERVE AS FLOATING LABORATORY FOR BIOLOGISTS:

A novel type of scientific vehicle will make its appearance along British Columbia's coast line in 1963. It will be a 76-foot steel research barge on which scientists of the Fisheries Research Board of Canada will conduct studies on fish populations. The barge is being built in British Columbia at a cost of C\$98,004 and should be ready for operation by April 1963.

The barge will be used as a floating laboratory and will be towed to various points along the coast where studies are to be made. It will be capable of accommodating an operating crew of 14 men for extended periods of time. Tentative plans call for the barge to be used along the British Columbia coast during the summer of 1963 to observe young salmon as they emerge from fresh water into the Pacific Ocean.

The hull and deckside of the barge will be constructed entirely of steel, while some other areas will be of wood construction. The barge will be assigned to the Board's Biological Station at Nanaimo, B. C.

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NEW DIRECTIONS IN FISHERIES RESEARCH DISCUSSED AT ANNUAL MEETING:

New directions in fisheries research, taken in the national interest, were noted by the Canadian Fisheries Minister at the opening (January 3, 1963) in Ottawa of the annual meeting of the Fisheries Research Board of Canada. He referred specifically to the Board's future role in the study of oceanography as well as its biological and technological programs under which results could be coordinated and applied to practical fishery management.

The Minister approved the fact that special consideration was given at the meeting to the study of oceanography and to the in-

creasingly complex subject of experimental biology. He thought Canada was fortunate in having well-organized programs in the former field developed through the Canadian Committee on Oceanography, where the needs and capabilities of all Canadian government agencies and oceanographic institutes could be considered and evaluated. He was pleased to note that representatives of the Department of Mines and Technical Surveys would be present at deliberations on oceanography.

In the field of experimental biology, he stated, more exact knowledge of the animals we are interested in became more and more important as man continued to change many aspects of the natural environment. This was particularly true, he said, of the fresh-water environment of salmon on both our coasts. He was gratified to know that the board had this important problem under constant and careful review and that answers were being developed as fast as our resources would allow. The Minister made particular reference to the need for maintaining and if possible increasing the numbers of Atlantic salmon, a fish in which there is great interest among many people not only as a commercial species, but as a sport fish. It has been declining in numbers since the white man first appeared on this continent and he thought it was of vital importance that its survival should be assured.

The progressive increase in fishing intensity on international fishing grounds by fishing fleets primarily from Europe and Asia was also mentioned by the Minister. Some of those grounds, off Canadian shores, have been fished by Canadian fishermen for so long that we have almost begun to think of them as our own, he said. The Minister was happy to see that the combined resources of the Department of Fisheries and the Fisheries Research Board were being brought to bear on improving the efficiency of fishing operations and the elimination of waste.

The international aspect of the fisheries was also referred to in the annual report of the Chairman of the Board, who said that the inevitable changes in the national and international fishing scene would be reflected in research requirements. It was certain, he said, that international studies would be continued if the conservation of high-seas resources was to be effective. In reporting on the manifold duties of the Board, the chairman said that more than half the resources of money, men, and materials spent on biological in-

Canada (Contd.):

vestigations was devoted to researches dictated by the needs of the five international fishery and sea-mammal commissions to which Canada is party.

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OCEANOGRAPHIC INFORMATION SERVICE AIDED BY AIRBORNE RADIATION THERMOMETER:

The airborne radiation thermometer developed by the Pacific Oceanographic Group (Nanaimo, B. C.) of the Fisheries Research Board of Canada has proved very successful, the annual meeting of the Board was told in Ottawa on January 3, 1963.

The airborne radiation thermometer is a device which enables readings of water surface temperatures from high speed aircraft. Following the successful trials of the device, four new units are being built for use on the Pacific and Atlantic coasts. The new units incorporate improvements to the first model.

The oceanographic information service developed by the group in collaboration with other scientific bodies, has completed its first full year of operation on Canada's Pacific coast. Group officials say the information service functioned successfully. In concept and operation the service is similar to the Meteorological Service, providing regular assessments of oceanographic changes rather than those of the weather.

The oceanographic information service has potential as an important aid to commercial fishing operations, as its scope and coverage are extended. The day is already in sight, a senior Canadian oceanographer states, when fishermen will find this information as vital to them as are the weather forecasts now. The movements of fish are very closely related to temperature and other conditions in the sea, and prior knowledge of changes in such conditions will be of great use in locating fish at a given period and place.

* * * * *

REFRIGERATED SEA WATER USED BY FISHING VESSELS:

The increasing use of refrigerated sea water for transporting salmon in British Columbia and the success of the brine-spray freezing system used on two Canadian tuna

vessels were described to the annual meeting of the Fisheries Research Board of Canada in Ottawa on January 4, 1963.

In British Columbia, refrigerated sea water equipment was added to two large barges in 1962. The barges have a combined capacity of over one million pounds of fish. The equipment was also added to four more salmon packers (transport vessels). British Columbia transport vessels using the equipment now have a combined single-trip holding capacity of 2.5 million pounds. In 1962, salmon packers were running long distances between the fishing grounds and canneries. The performance of refrigerated sea water equipment was considered superior in landing fish in prime condition.

Two applications of the refrigerated sea water system are in use in British Columbia. One involves mechanical refrigeration while the other uses a mixture of ice and salt for refrigeration.

Although the Canadian brine-spray freezing system is similar to the freezing method used on United States tuna vessels, it differs in three important respects. In the Canadian-designed system, freon refrigerant is used instead of ammonia; external heat exchangers are substituted for coils in the hold; and the fish hold is insulated and jacketed for dry-frozen storage of fish. The tuna catches landed by the two Canadian vessels equipped with the system were in excellent condition and the system was found to require little maintenance in operation.

Note: See *Commercial Fisheries Review*, November 1962 p. 61, February 1962 p. 59.

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REFRIGERATION STANDARDS FOR CARRIERS OF FISHERY PRODUCTS PROPOSED:

Regulations containing strict refrigeration standards for rail and motor carriers hauling fresh and frozen fishery products have been proposed by the Canadian Department of Fisheries, according to reports. The regulations would affect carriers moving fishery products in Canadian foreign trade as well as inter-provincial trade. The proposed regulations are said to contain the following standards:

(1) Fresh, whole, or processed fish shall be transported in export or import trade by

Canada (Contd.):

carriers maintaining a maximum product temperature of 35° F.

(2) Frozen, whole, or processed fish shall be transported in export or import trade by carriers maintaining a product temperature of 0° F. or lower, provided that a transition period during which procedures may be improved and equipment modified may be permitted according to the following schedule: January 1, 1963 to December 31, 1963, maximum of 20° F.; after January 1, 1964, 0° F. or lower.

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NEW AIR PRESSURE SYSTEM FOR UNLOADING SALMON DEMONSTRATED:

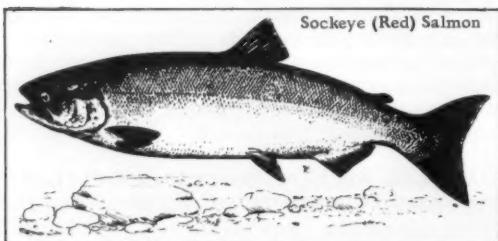
The "pneumatic unloading" system of the Canadian salmon packer Derek Todd puts salmon on the dock with remarkable speed. The system involves the use of air pressure to force fish out of specially constructed tanks. Successful trials of "pneumatic unloading" in British Columbia were described to the annual meeting of the Fisheries Research Board of Canada in Ottawa on January 3, 1963.

The Board's Vancouver technological station worked in collaboration with a Vancouver fishing company in developing the system. The Derek Todd was equipped with four air pressure tanks and has a total capacity of 129,000 pounds of fish. The vessel also has a mechanically operated refrigerated sea water unit.

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PACIFIC SALMON TAGGING AND DISTRIBUTION STUDIES, 1962:

The 1962 tagging and distribution studies of Pacific salmon on the high seas were described as an "outstanding success" in a report submitted on January 4, 1963, to the an-



nual meeting in Ottawa of the Fisheries Research Board of Canada.

Under the direction of the Board's biological Station in Nanaimo, B.C., four chartered vessels used Japanese long-line gear to take salmon over a broad area of the Gulf of Alaska--up to more than a thousand miles from the coast. Nearly 20,000 salmon of all species were caught, tagged, and released and over seven percent of them were recovered.

Primarily, the tagging program was aimed at charting the distribution of Canadian west coast salmon stocks on the high seas. This has been accomplished. The main bodies of Canadian salmon were found to be well east of current Japanese deep-sea salmon fishing operations, confirming conclusions reached earlier by fisheries scientists.

Distribution patterns were found to be surprisingly consistent and apparently linked to oceanographic conditions. This discovery has opened new approaches to the problems of ocean survival and growth, as well as to prediction of the sizes of runs.

During April and May 1962, a preliminary attempt was made to identify the origin of the sockeye salmon, several weeks before the maturing fish would head for their home streams. Scale readings indicated that over two-thirds of the sockeye were headed for Alaskan streams and that the proportion bound for Adams River, B.C., was small. These estimates followed the actual catch percentages very closely. Alaska produced about 70 percent of the total North American sockeye catch in 1962, while the Adams River run was very small. Those results suggest that useful advance information on the relative abundance of runs may be gained through similar programs.

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PINK SALMON EGGS FROM BRITISH COLUMBIA TRANSPLANTED IN NEWFOUNDLAND RIVER:

A major undertaking in 1962 by the St. John's, Newfoundland, Biological Station of the Fisheries Research Board of Canada, was the transplant of some 2.5 million pink salmon eggs from British Columbia to Newfoundland. The eyed eggs, spawned in a British Columbia River, were transported by air in late November 1962 to St. John's, and from there were taken by road transport to North Harbour River, St. Mary's Bay.

Canada (Contd.):



Within days the transplant was completed, but preparation of the receiving channel had occupied many months. The channel, 1,770 feet long and 16 feet wide, was excavated about 2.5 miles upstream from the mouth of the river, and was filled with washed gravel to a depth of one foot.

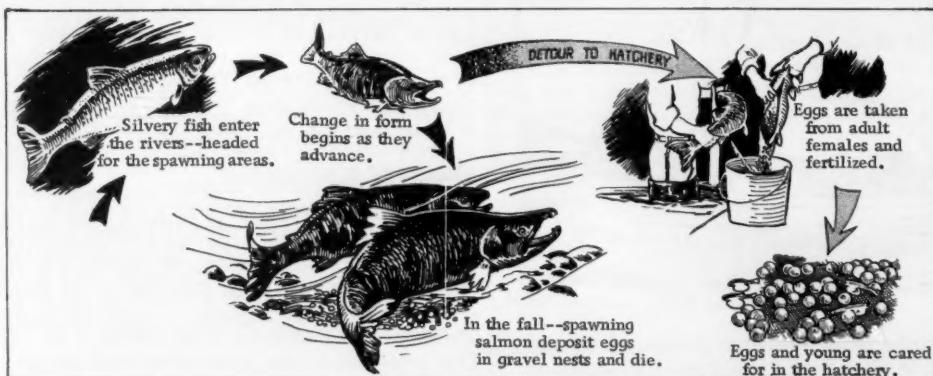
About 50 feet from the head of the channel a dam was constructed, and, to prevent scouring, the area below the dam for a distance of 65 feet was covered with small boulders.

SCIENTISTS EXTEND NORMAL LIFE CYCLE OF SOCKEYE SALMON:

Adult sockeye or red salmon which would have spawned and died under natural conditions have been kept alive in captivity at the Vancouver, B. C., Technological Station of the Fisheries Research Board of Canada. The Board heard a report on this and other activities of the Technological Station during its January 1963 annual meeting in Ottawa.

Some of the fish have survived for over a year in excess of their normal lifespan in an experiment which has stimulated studies of biochemical and histological changes as they relate to prolonging the salmon's survival.

During the normal period of spawning, some of the fish were force-fed, others were left unfed, and some were gonadectomized (spayed) and force-fed. In both groups a number of fish eventually resumed voluntary feeding, and they regained their normal coloration. It is hoped that the survival of spawned salmon can be studied more fully as a result of this work.



The Board was informed at its annual meeting in Ottawa on January 5, 1963, that work on the channel is to continue, in preparation for further transplantsations in 1963.

The outcome of this experiment will be awaited with much interest. Success in the undertaking could mean the eventual establishment of a pink salmon fishery on the Atlantic coast, thus shifting some of the fishing pressure off the Atlantic salmon. This, in turn, could assist in the replenishment of the Atlantic salmon runs which for some years have been on the decline.

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By creating conditions which drastically alter the salmon's normal life-death processes, fisheries research scientists have opened significant new fields of study.

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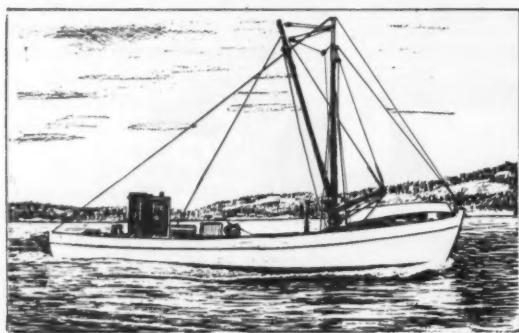
SCALLOP LANDINGS AT ATLANTIC PORTS SET NEW RECORD IN 1962:

Landings of sea scallops at Canada's Atlantic ports increased again in 1962 and established another record. Landings totaled about 14 million pounds of shucked meats valued at about C\$4 million. Both the offshore and the inshore scallop fisheries shared in the increase.

Canada (Contd.):

The bulk of the landings (90-95 percent) were landed again by the offshore fleet which fished almost exclusively on Georges Bank. The increased landings were due to a further build-up of the offshore fleet (39 vessels in 1962 as compared with 28 in 1961). As was predicted, the catch per vessel was down from 1961. However, the ex-vessel price per pound increased and this compensated for the decrease in catch, and earnings should be the same or slightly more than in 1961. Vessel crew sizes in 1962 remained the same or were slightly smaller as compared with 1961.

Staff members of the Fisheries Research Board of Canada made two trips on commercial vessels to sample catches, study mortalities, and make biological observations. Their findings were contained in a report made on January 5, 1963, at the Board's annual meeting.



Typical Digby scallop boat.

The Digby scallop fishery showed an increase in landings in 1962 over 1961. This fishery is in one of its cyclic periods of abundance. Price increases in 1962 provided a further incentive for that fishery.

The outlook for the Canadian scallop fishery continues to be bright. The offshore fleet will probably increase in 1963 to about 50 vessels. Results of limited sampling indicate that the incoming year-class is not particularly strong and is about the same strength as the one that entered the fishery in 1962. Hence the catch per vessel may decrease further in 1963, but total landings may rise slightly due to the increase in fleet size. If the ex-vessel price for sea scallops continues to increase slightly, the earnings per vessel should be about the same in 1963

as in 1962. (Department of Fisheries, Ottawa, January 5, 1963.)

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SHARK MIGRATION STUDIES AIDED BY NEW BRANDING TECHNIQUE:

Branding irons for cattle have been common for many years, but it was only in the summer of 1962 that they were used at sea for the first time. The reason for this and the methods were explained on January 4, 1963, at the annual meeting in Ottawa of the Fisheries Research Board of Canada.

Recent interest in mackerel sharks as food, especially by Norwegian fishermen who have been catching them off Nova Scotia for the Italian market, brought out the fact that very little is known about shark migrations.

In fish migration studies, marking is usually done by attaching some kind of tag or clipping off various combinations of fins. Many of the tags used on large fish are of the dart or fish-hook type; that is, they are held in place by a barb in the meat, while the message is carried in a tube or on a plastic dangler suspended from it. On large fish these are relatively small. Many sharks are cut clear of fishing gear without being boated, so it is important that they be marked conspicuously enough to attract attention in the water alongside the vessel.

Scars on the back or sides of large fish are usually easily seen, so a branding technique was devised by the St. Andrews, New Brunswick, Biological Station of the Board, using letters and figures 1.5 inches high. Twenty-three sharks were marked in 1962. One recapture has been recorded so far--the fish was marked with both a tag and a brand at Corsair Canyon on southeast Georges Bank and re-caught at Hydrographer Canyon about 150 miles to the southwest a month later.

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COMMERCIAL CATCHES OF SWORDFISH BY LONG-LINE IN 1962 VERY GOOD:

The first commercial attempts in Canadian Atlantic waters to combine long-lining for swordfish with the traditional harpoon method of fishing has been successful. In early September 1962, the vessel *Dorothea Reeves* landed 101 swordfish at North Sydney, Cape Breton Island. Ninety-three of the fish were caught with long-lines. Before the 1962 sea-

Canada (Contd.):

son ended there were at least 32 vessels long-lining for swordfish and preliminary records show that more than 1,500 swordfish were caught by that method. That number represents a landed weight of about 400,000 pounds and a landed value of more than C\$250,000.



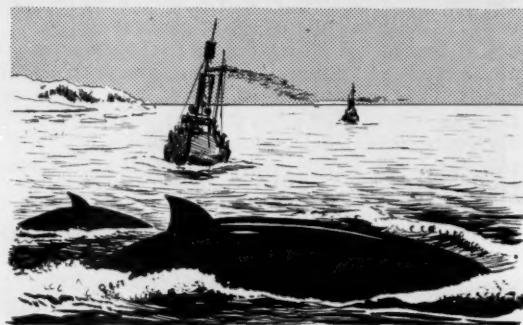
One of the great advantages of long-lining swordfish is that the gear can be used at night and when the weather is unsuitable for harpooning, which greatly increases the fishing time per trip. In addition, there is evidence that both male and female swordfish can be caught with long-lines whereas only females are caught with harpoons. It seems possible, too, that long-lining will extend the fishing season by 6 to 8 weeks and provide better opportunity for increased landings.

The St. Andrews Station of the Fisheries Research Board of Canada reported at the Board's annual meeting in Ottawa on January 3, 1963, that it has been carrying out long-lining experiments for large pelagic fish since 1960, and has demonstrated the effectiveness of that gear for catching swordfish, tuna, and mackerel sharks, all of which are potentially valuable to the fishing industry. This work will continue in an attempt to learn more of the distribution, abundance, and movements of those species in Canadian waters.

REVIVAL OF BRITISH COLUMBIA WHALING INDUSTRY AIDS BIOLOGISTS:

Biological studies of eastern North Pacific whale stocks by the International Whaling Commission was given impetus in 1962 through the formation of a special committee with specific responsibility in that field. Canada is a member of the Commission, together with a number of other countries with whaling interests. A report on whale studies at the Nanaimo Biological Station, B. C., was presented on January 4, 1963, to the annual meeting in Ottawa of the Fisheries Research Board of Canada.

The resumption of whaling in British Columbia in 1962, after a shutdown lasting two years, provided a source of biological specimens vital to the research program. Fin and sperm whales, which normally predominate



in British Columbia catches, were scarce in 1962 and were dispersed farther offshore than is usual. Sei whales compensated for the reduced catches of fin and sperm in number, but not in oil yield, because the sei is a smaller whale.

No marking was done by Canada in 1962, but one marked sei whale was recovered. It was the first whale mark recovery in British Columbia waters. (Department of Fisheries, Ottawa, January 4, 1963.)

Note: See *Commercial Fisheries Review*, April 1962 p. 42; January 1962 p. 46.



Chile

FISHERY TRENDS, DECEMBER 1962:

A spokesman of the Japanese Embassy in Santiago has announced a visit to Iquique (in northern Chile) of representatives of Japanese firms interested in investing in Iquique. The Embassy also reported that two Japanese firms have requested sites in the industrial section of Iquique for setting up plants to make fish nets.

The rapid growth of the fishing industry in Chile has created a strong demand for new fishing vessels. At the present time, the only vessel building industry in northern Chile is the shipyard operated by a joint United States-Chilean firm in the port of Iquique. The firm, which can build 20 to 24 vessels a year, has all the orders it can handle. It is building all-

Chile (Contd.):

steel vessels. The vessels are equipped with 250 horsepower motors and have an average holding capacity of 100 to 150 metric tons. Several fishing companies are interested in vessels with a capacity of 250 tons which could be used for tuna fishing when plants are expanded to provide canning and freezing facilities. An Antofagasta firm has requested the use of the piers owned by the Corporacion de Fomento de la Produccion de Chile in Antofagasta for the purpose of constructing steel fishing vessels.

The Chilean fishing industry is also seeking independent vessel owners willing to fish under contract. Three United States fishermen recently brought their trawlers to Chile. They are working under contract with a Valparaiso shellfish company fishing for langostino and shrimp. Empresa Pesquera Tarapaca, the integrated fisheries company organized by the Chilean Government, recently announced the delivery of its first vessel, but construction of the firm's fish meal plant

has not started. The vessel will, therefore, fish under contract for one of the privately-owned firms in Iquique.

Representatives of a large United States pharmaceutical firm visited Iquique in December 1962 and indicated that plans are under study for the construction of a plant to produce fish flour for human consumption. An investment of approximately US\$2 million was reportedly under consideration. (United States Consul, Antofagasta, January 2, 1963, and United States Embassy, Santiago, January 24, 1963.)

**Denmark****SECOND DANISH-BUILT FISH FREEZING VESSEL DELIVERED TO U.S.S.R.:**

The M/S Vitus Bering, the second of four fish-freezing vessels being constructed by a Copenhagen shipyard, for V/O Sudoimport, Moscow, was delivered to the Soviet organi-



Fig. 1 - Aerial view of the M/S Vitus Bering, fish-freezing vessel built in Denmark for the U.S.S.R. Shows stern ramp for hauling in loaded cod ends and deck layout.

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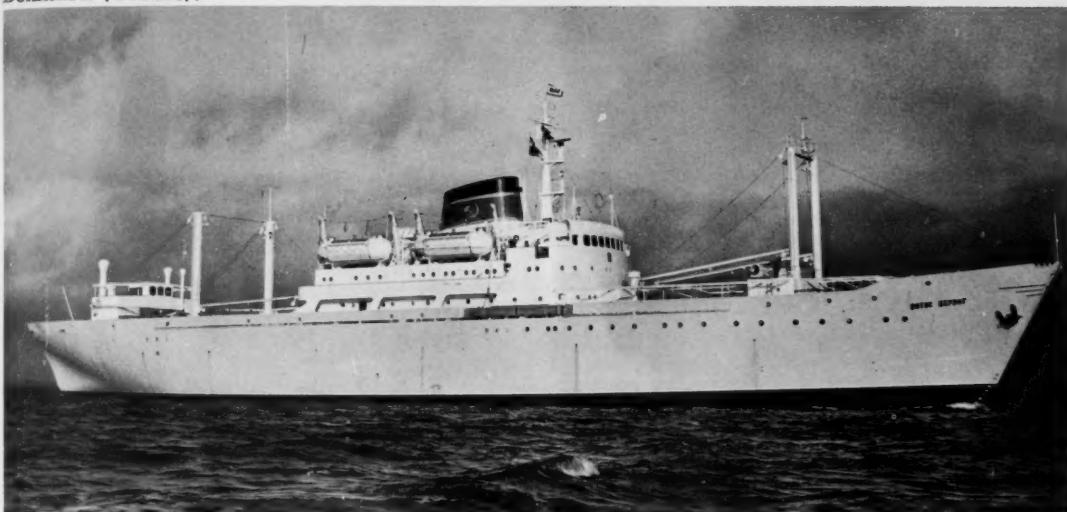


Fig. 2 - Another aerial view of the M/S Vitus Bering. Shows the clean modern lines of the new fish-freezing vessel which was assembled from six prefabricated sections in only 19 working days by a Danish shipyard.

zation early in January 1963. The 2,600-ton vessels, identical in size and equipment, receive fish, for dressing and freezing, from accompanying trawlers by way of a stern chute or over the side. The first refrigerated carrier vessel of this group, the M/S Skryplev, was launched on May 10, 1962. (Fisheries Attaché, United States Embassy, Copenhagen, January 16, 1963.)

Note: See Commercial Fisheries Review, September 1962 p. 71, August 1962 p. 59, and July 1962 p. 104.

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FISH FILLETS AND BLOCKS AND FISHERY INDUSTRIAL PRODUCTS EXPORTS,

JANUARY-NOVEMBER 1962:

Denmark's exports of fresh and frozen fillets and blocks during the first 11 months of 1962 were 19.6 percent greater than in the same period of 1961, mainly because of an increase of 107.4 percent in exports of herring fillets. Exports of flounder and sole fillets increased 8.4 percent, but exports of cod and related species declined 4.3 percent. During the first 11 months of 1962 exports to the United States of fresh and frozen fillets and blocks of about 10.8 million pounds (mostly cod and related species) were up from the exports of about 10.2 million pounds in the same period of 1961.

Denmark's exports of fresh and frozen fish fillets and blocks during November 1962 were 26.5 percent above exports in the same month in 1961. Of the total exports, about 160,000 pounds (mostly cod and related species) were shipped to the United States in November 1962 as against 206,000 pounds in the same month in 1961. The leading buyer of frozen fillets in November 1962 was West Germany with 50.0 percent of the total, followed by the United Kingdom with 14.1 percent.

Denmark's Exports of Fresh and Frozen Fish Fillets and Blocks and Fishery Industrial Products, Jan.-Nov. 1962/

Product	November		Jan.-Nov.	
	1962	1961	1962	1961
Fillets and Blocks:				
Cod and related species	1,456	1,250	27,296	28,536
Flounder and sole	2,030	2,126	26,576	24,515
Herring	3,987	2,512	24,288	11,713
Other	40	51	593	1,081
Total	7,513	5,939	78,763	65,845
Industrial Products:				
Fish meal, fish solubles, and similar products	5,684	2,712	65,500	47,793
/Shipments from the Faroe Islands and Greenland direct to foreign countries not included.				

Denmark's exports of fish meal, fish solubles, and similar products in January-November 1962 were 37.0 percent greater than in the same period of 1961. Exports to the United States during the period were 110 tons in 1962 as against 28 tons in 1961.

During November 1962, Denmark's exports of fish meal, fish solubles, and similar products were 109.6 percent above the amount shipped out in the same month of 1961. The principal buyers were Finland and the United Kingdom.



El Salvador

EXPORTS OF EDIBLE FISHERY PRODUCTS, 1961:

Shrimp shipments to the United States accounted for 93.5 percent of the quantity and

El Salvador (Contd.):

El Salvador Exports of Edible Fishery Products, 1961					
Commodity and Destination	Quantity	Value			
	Metric Tons	1,000 Colones	US\$ 1,000		
Shrimp, Fresh and Frozen:^{1/}					
United States	4,089.6	13,937.2	5,574.9		
Japan	171.6	545.4	218.2		
Honduras	15.4	29.3	11.7		
Guatemala	0.3	0.5	0.2		
Total shrimp	4,276.9	14,512.4	5,805.0		
Shellfish (other than shrimp), Fresh, Frozen, and Cured:					
Costa Rica	7.3	14.2	5.7		
Guatemala	52.3	17.5	7.0		
Honduras	10.4	10.2	4.1		
Other countries	2/	0.1	4/		
Total shellfish (other than shrimp)	70.0	42.0	16.8		
Fish, Fresh and Frozen:					
Guatemala	5.6	7.8	3.1		
Honduras	11.1	10.6	4.2		
Nicaragua	0.1	3/	4/		
Total fresh & frozen fish	16.8	18.4	7.3		
Fish, Cured:					
Guatemala	8.3	10.8	4.3		
Honduras	1.3	2.0	0.8		
Total cured fish	9.6	12.8	5.1		
Fish and Shellfish, Canned:					
Honduras	0.3	1.3	0.5		
Grand Total	4,373.6	14,586.9	5,834.7		

^{1/}Probably mostly frozen.^{2/}Less than one-half metric ton.^{3/}Less than 500 colones.^{4/}Less than 500 U.S. dollars.

Note: Colones 2.5 equal US\$1.00.

Source: *Anuario Estadístico*, 1961, Vol. 1, El Salvador.

95.5 percent of the value of El Salvador's total exports of edible fishery products in 1961.



Faroe Islands

EXPORTS OF FROZEN FISH FILLETS, JANUARY-SEPTEMBER 1962:

Exports of frozen fish fillets from the Faroe Islands during January-September 1962 were up 120.0 percent in quantity and 78.1 percent in value from those in the same period of 1961. The increase was due mainly to the development of markets in East Germany and Hungary and larger shipments

Country of Destination	Faroeese Exports of Frozen Fish Fillets, January-September 1962-61					
	Jan.-Sept. 1962		Jan.-Sept. 1961			
	Qty.	Value	Qty.	Value	Metric Tons	US\$ 1,000
United States . . .	188	592.0	85.6	334	1,089.0	159.0
United Kingdom . .	304	825.0	119.4	56	152.0	22.0
East Germany . . .	251	539.0	78.0	-	-	-
Hungary	100	211.0	30.5	-	-	-
Denmark	11	38.0	5.5	4	12.0	1.7
Sweden	13	44.0	6.4	-	-	-
Total	867	2,249	325.4	394	1,263.0	182.7

Note: (Danish) krone 6,911 equal US\$1.

to the United Kingdom. On the other hand, exports to the United States were down 43.7 percent in quantity and 46.1 percent in value. The value of the exports in 1962 did not increase as much as the quantity because of the decline in the higher-priced shipments to the United States. (*Faroes in Figures*, No. 20, December 1962.)



France

JOINT JAPANESE-FRENCH TUNA BASES IN SOUTH PACIFIC APPROVED:

The French Government's Foreign Investment Committee, composed of the Finance Ministry and the Overseas Ministry, is reported to have approved, in principle, establishment of the joint Japanese-French tuna bases in Tahiti and New Caledonia, as originally proposed by a large Japanese fishing company in early 1962. Formal approval by the French Government was expected to be given in a matter of weeks.

The proposed joint tuna enterprise at New Caledonia will be located on 72,000 square meters of land in the bay located nearby the capital city of Noumea, with French interests contributing 51 percent of the investment and the Japanese fishing company 49 percent. Base facilities will include a 2,000-ton capacity cold-storage plant and a freezer unit capable of quick-freezing 50 metric tons of tuna a day. In addition, docking facilities, living quarters, and storage areas will be constructed.

The Japanese firm plans to contract about 40 Japanese fishing vessels to fish out of the New Caledonia base and reportedly will pay the same prices for tuna as those paid by the United States cannery in Samoa.

The proposed joint tuna base at Tahiti is to be constructed at Papeete. Parties to this joint venture, in addition to the same Japanese fishing company, are a large United States tuna packing company and a French company. Plans call for constructing a 2,000-ton capacity cold-storage plant at Papeete which would be used to store tuna for transshipment to the United States tuna company's packing plant in the United States. (*Suisan Keizai Shimbun*, January 11, 1963, and other sources.)

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MESH SIZE REGULATION FOR OTTER TRAWLS IN NORTHWEST ATLANTIC FISHERY:

A decree of January 1, 1963, specified that French vessels fishing in the Northwest Atlan-

France (Contd.):

tic for cod, haddock, and certain flatfish may not use otter trawls of a mesh finer than 114 millimeters (4.5 inches). Vessels trawling for other kinds of fish may use finer nets if their incidental catch of the specified species does not exceed certain percentages, mostly 10 percent. This decree is said to follow the recommendations of the 1961 session at Washington, D. C., of the Northwest Atlantic Fisheries Commission. (United States Embassy, Paris, January 12, 1963.)

Note: See Commercial Fisheries Review, September 1961 p. 61.



Greenland

FIRST PRIVATELY-FINANCED FISH-PROCESSING FIRM:

The establishment of a new fish-processing firm in Greenland as a joint venture of fishing industry interests in Greenland, Denmark, and the Faroe Islands marks the first step toward large fishery operations by private enterprise, rather than by the Royal Greenland Trade Department (a Danish governmental unit). The Department stimulated the development of the new company, which will fillet and freeze fish for the United States market and produce fish meal from fillet waste and, in season, from capelin.

Beginning in August 1963, the firm's new plant is expected to produce 40,000 pounds of fillets daily. (United States Embassy, Copenhagen, January 23, 1963.)



Hong Kong

FISH FARMING ADDS TO FOOD SUPPLY:

The constantly increasing population (rose from 1.5 million to 3.5 million in past ten years) of Hong Kong has posed serious problems of employment and food supply. However, the ingenuity and industry of the Chinese, who are even growing vegetable crops in the sand of the seashore, are helping to cope with the problem. And so are the experts of Hong Kong's Department of Agriculture and Forestry through its experimental stations in livestock, forestry, crops, and fisheries. Among the programs to provide

more protein, that of fish farming has been very encouraging.



Fig. 1 - How the embankments, causeways and fish ponds are built. Men cut the heavy, greasy clay and women slide it along ramps to be built up into causeways and banks to contain the ponds.

"In fact," said the Director of Agriculture and Forestry, in an interview with a Food and Agriculture Organization correspondent, "the acreage under fish ponds has almost doubled in the past two years, from about 600 to something like 1,100 acres."

Fish farming is increasing employment of the poorer classes of workers and adding to the income of the investors. It is also leading to a bigger supply of fish to the local market. On average, a pond of one acre yields around one ton of fish a year, a harvest which brings in, roughly speaking, a gross of about \$HK.5,000 (US\$875). The total value of the annual production from fish ponds in Hong Kong is now over \$HK.5 million (US\$875,000).



Fig. 2 - Some of the fish ponds that have been developed in the new territories area. The acreage under fish ponds has almost been doubled in the past two years, from about 600 to a round 1,100 acres.

Hong Kong (Contd.):

"As most of the fish farmers have between 3 and 6 acres of ponds, you can appreciate that fish farming is a worthwhile business," the Director stated. "But, of course, the farmers and their families also keep chickens and ducks, perhaps a pig or two and a water buffalo or other cattle, all of which adds to their standard of living."

The Chinese, who have practiced the art of fish culture for many centuries, obtain very high yields. Chiefly they cultivate grey mullet and various species of carp--grass, silver, mud, black, and common carp, for example. The number of fish that can be raised per acre depends on the fertility of the pond. They have also developed the art of raising pond fertility to a high level. They usually stock an acre of water with about 10,000 grey mullet fry and about 2,000 Chinese carp fry. Mortality rates are high due to a variety of causes, but the ultimate yield of fish per acre is also very high--probably the highest in the world.

The Hong Kong fish farmers have learned how to raise marine fish, the grey mullet, fresh-water fish, and the grass and several other species of carp, in brackish water. This calls for considerable skill and knowledge in maintaining a proper salinity value tolerable to both kinds of fish. And it is in such circumstances that science comes to the aid of the fishermen through the work of the Pond Fish Experimental Unit. This body of the Department of Agriculture and Forestry is concerned, among other things, with water analysis.



Fig. 3 - A biologist from the Freshwater Fisheries Experimental Unit of the Department of Agriculture and Forestry, Hong Kong, making a salinity test.

"Such work provides a useful service to the fish farmers," said the Director. "They no longer have to rely entirely on their own judgement but can, in effect, exercise scientific control."

The Pond Fish Experimental Unit has a big program of work and in order to carry this out it is expanding. The Unit started with two ponds and will shortly have 20 which will make it possible to carry out replicated trials. This is important as it will make possible accurate statistical analysis of results. The Unit also works on such problems as the growth rate of fish, the effects of different fertilizers on pond fertility, and other problems.

"The high yield of protein per acre from fish farming makes it particularly important in a crowded area such as Hong Kong where industrial and urban development encroaches on the limited amount of arable land available," the Director stated. He added, "fish farming which yields about \$HK.5,000 (US\$875) per acre makes excellent use of land that would otherwise yield only \$HK.300 (US\$52.50) if given to sea grass or brackish paddy. We are therefore doing our best to encourage fish farming but, of course, there is capital outlay involved. Although it costs a few thousand dollars to construct a fish pond, most fishermen haven't any capital. If, for example, we could obtain financial support under the Freedom From Hunger Campaign, we could help many more refugees and others to set up as fish farmers."

He pointed out that the Hong Kong Government had already carried through many land reclamation schemes for housing and industry. However, it would be possible to reclaim land from the sea for fish farming but that would need capital investment on a large scale.

"I cannot say how much would be needed before making a complete investigation and survey," he concluded. "But such a scheme, if carried through, would provide land for the settlement of some thousands of families and would, through fish farming and agriculture, help to feed Hong Kong's millions."



Iceland**FISHERY TRENDS, EARLY JANUARY 1963:**

Winter Herring Landings: The herring catch on the southwest coast of Iceland, through January 5, 1963, amounted to 80,146 metric tons, compared with 74,999 tons taken by January 6, 1962. About 131 vessels were fishing for winter herring this season compared with 108 the previous year. According to Icelandic press reports, there has been some slowdown in herring landings because the reduction plants were unable to handle the load.

Two Groups Interested in Buying Inactive Reduction

Plant: A group of 20 to 30 fishing vessel owners have expressed an interest in buying a reduction plant located in the inner harbor of Reykjavik, according to the newspaper *Althydubladid*. The processing capacity of the plant is about 337 tons per day. The State herring reduction plants in the north are also reported to be interested in the plant. The plant was built with United States Marshall Plan Funds but was never operated since its construction because of faulty machinery discovered during the trial run and also the lack of incentive resulting from a number of years of poor herring catches. The factory is partly owned by the City of Reykjavik and partly by private parties. The very favorable location of the factory would permit trawlers to unload their fish directly into the factory from the pier. The only other reduction plant in the Reykjavik area requires a 15-minute run by truck, which increases the cost considerably.

Retail Fish Prices Increase: As a direct result of the recent increases announced by the Fish Pricing Board, retail sales prices of fresh fish (excluding herring) increased 9.5 to 17.5 percent. (United States Embassy, Reykjavik, January 11, 1963.)

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FISHING FLEET AND ESTIMATED FISHERY LANDINGS, 1961-62:

The total tonnage of Iceland's fishing fleet in 1962 was 1.9 percent greater than in 1961 in spite of a small cutback in the trawler fleet. Fishing vessels accounted for 53.3 percent of the tonnage of all vessels registered in Iceland. A total of 26 Icelandic vessels with a combined tonnage of 1,685 gross registered tons were lost at sea, ran aground, or drifted ashore in 1962.

Size of Icelandic Fishing Fleet, 1962-61				
Type of Vessel	1962	1961	Number of Registered Vessels	Gross Tons
Trawlers	47	32,816	48	33,470
Other fishing and whaling vessels of over 100 g.r.t. ..	111	18,206	100	16,246
Other fishing vessels under 100 g.r.t. ..	676	23,591	657	23,539
Total	834	74,613	805	73,255

The Director of the Fisheries Institute of Iceland, estimated that Iceland's total fishery landings amounted to 820,000 metric tons in 1962. According to preliminary data, the total catch in 1961 amounted to 710,000 tons. (Data based on round or whole weight of fish.) The herring catch in 1962 totaled 473,000 tons, up 45.1 percent from the herring catch of 326,000 tons in 1961, according to the newspaper, "Althydubladid." The estimated fishery landings in 1962 indicate a decline in the catch of species other than herring. The shellfish catch in 1962 was estimated at 2,900 tons,

about the same as in 1961. (United States Embassy, Reykjavik, January 11, 1963.)

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FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-AUGUST 1962:

Species	January-August	
	1962	1961
	(Metric Tons)	
Cod	162,765	171,764
Haddock	24,445	23,460
Saithe	7,669	7,434
Ling	4,605	3,900
Wolffish (catfish)	11,335	11,079
Cusk	3,696	3,586
Ocean perch	9,655	20,508
Halibut	975	1,106
Herring	382,235	248,600
Shrimp	349	430
Other	8,540	8,215
Total	616,269	500,082

Note: Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-AUGUST 1962:

How Utilized	January-August	
	1962	1961
	(Metric Tons)	
Herring ^{1/} for:		
Oil and meal	301,210	179,779
Freezing	18,138	10,204
Salting	54,843	54,498
Fresh on ice	7,718	4,119
Canning	336	-
Groundfish ^{2/} for:		
Fresh on ice landed abroad	14,559	16,960
Freezing and filleting	108,597	118,049
Salting	67,283	63,545
Stockfish (dried unsalted)	31,940	42,495
Home consumption	7,338	5,595
Oil and meal	1,693	2,998
Shellfish for:		
Freezing: Lobster	2,274	1,410
Shrimp	263	304
Canning (shrimp)	86	126
Total Production	616,269	500,082

^{1/}Whole fish.

^{2/}Drawn fish.

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FRESH FISH EX-VESSEL PRICES ESTABLISHED FOR 1963:

Ex-vessel fresh fish prices, effective January 1, 1963, have been established by Iceland's Fish Pricing Board. The average price increase is $9\frac{1}{2}$ percent. Top-grade cod and haddock were increased $12\frac{1}{2}$ percent or from 3.21 kroner per kilogram (about 3.36 U. S. cents a pound) to 3.60 kroner per kilogram (about 3.80 cents a pound). The

Iceland (Contd.):

price increases for fish of lower quality were smaller. (United States Embassy in Iceland, January 3, 1963.)

Note: Values converted at rate of 1 kroner equals 2.32 U. S. cents.

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HERRING LANDINGS VERY GOOD THROUGH DECEMBER 1962:

Aided by favorable weather conditions, Iceland's southwest coast herring catch through the end of 1962 was reported very good. If the same number of vessels continue to fish and if the weather continues favorable through January, it is predicted that the herring catch will be large enough to tax the capacity of the southwest coast reduction plants.

The contract recently concluded with the Soviet Union for southwest coast herring specifies a minimum 15 percent fat content and the catch through December 1962 was running at about that minimum.

**India****COLLABORATION SOUGHT FOR NEW FISH AND SHRIMP PROJECT:**

Financial and technical collaboration is still being sought by the Gujarat Fisheries Central Cooperative Association, Ltd., of Ahmedabad, India, for a commercial fisheries project it plans to establish at Okha Port on the Saurashtra coast of Gujarat State, India. The project envisages the employment of five medium mechanized vessels to exploit the shrimp resources of the Gulf of Kutch and two trawlers to carry on offshore fishing in the Arabian Sea. In addition, two transport launches are proposed to be bought to bring fish landed in the adjoining fish harbors by other fishermen.

The project will, moreover, include the establishment of fish canning, quick freezing, cold-storage, and fish meal plants. Besides exploiting the domestic markets in the principal cities such as Bombay and Delhi, efforts will also be directed to export processed fish to the United States, Germany, and other foreign countries.

The Gujarat Association is the largest fishermen's cooperative in India and the Gulf of Kutch is believed to offer considerable scope for shrimp fishing.

Note: See *Commercial Fisheries Review*, May 1962 p. 51.

**Indonesia****FIRST FROZEN TUNA EXPORTS TO UNITED STATES:**

The first exports of frozen tuna to the United States by the Indonesian General

Management Board of State Fisheries were made on January 7, 1963. The exports, amounting to 40 metric tons, were made under the production-sharing contract between an Indonesian firm and a subsidiary of a large United States tuna canning firm.

In a formal ceremony marking the occasion, the Minister for Agriculture and Agrarian Affairs remarked that, although the first shipment was small, it was significant as the first result of a production contract in the field of fisheries. (United States Embassy, Djakarta, January 11, 1963.)

**Japan****ATLANTIC OCEAN FISHING CONDITIONS AND FROZEN TUNA PRICES:**

Japanese albacore fishing in the Atlantic Ocean improved greatly in December 1962, and it was hoped that good fishing would prevail through January 1963. Reportedly, albacore tuna presently constitute 70-80 percent of tuna caught by vessels fishing in the South Atlantic.

Prices of frozen albacore tuna for export to the United States from the Atlantic Ocean fishery had recovered as of early January 1963. Reportedly, over \$320 per short ton was being paid for albacore unloaded at Las Palmas, Canary Islands, for transshipment to United States American canneries in Puerto Rico.¹ As for the European tuna market, albacore tuna were being exported almost wholly to Yugoslavia at \$420 per metric ton, c.i.f. Hamburg. (Suzan Tsushin, January 11, 1963.)

¹/Mid-January 1963 information indicates that \$315-\$320 per short ton was being paid for albacore landed at Las Palmas.

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CANNED TUNA PRICES:

The Japan Canned Foods Exporters Association's canned tuna sales committee, on January 8, 1963, conducted its first canned tuna export price negotiations of the year with the Canned Tuna Sales Company (representing packers). At the meeting, the Exporters Association sought agreement from the packers for a drastic price reduction of \$1 per case (48 7-oz. cans) for canned white meat tuna in brine and an 80-cent-per-case reduction for canned light meat tuna in

Japan (Contd.):

brine.^{1/} However, the packers gave no definite reply at the meeting.

On January 17, the directors of the Japan Canned Tuna Packers Association met to discuss the price adjustments sought by the canned tuna exporters. Although no agreement was reached, opinions expressed at the meeting indicated strongly that the packers would not agree to the drastic price reductions. (Suisan Tsushin, January 10 & 19, 1963.)

^{1/}Editor's Note: The most current price information for Japanese canned tuna is for September 1962 (Tenth Sale). At that time, white meat tuna in brine sold for \$10.40 per case and light meat tuna in brine \$7.80 per case (all prices f.o.b. Japan).

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PRICE RESTRICTIONS ABOLISHED ON FROZEN TUNA FOR EXPORT TO U. S.:

On October 22, 1962, the Japan Frozen Food Exporters Association opened a meeting of its tuna department for a discussion of the sales policy applied to the United States. As a result, the interfirm conference prices of \$340 a short ton f.o.b. for albacore and \$290 for yellowfin, which had been established in September 1962, were abolished.

At the same time, the system of bottom or floor prices for exports to the United States, which had been fixed at \$350 for albacore and \$310 for yellowfin, were also abolished.

Thus, export prices of frozen tuna for export to the United States are now free of restrictions, but the Association intends to examine means of stabilizing prices in close cooperation with the producers. (Japanese periodical, October 24, 1962.)

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DESCRIPTION OF TUNA CATCH STATISTICS:

A speech titled "Investigation for Tuna Catch Statistics," by Noriaki Oka, Chief, Fisheries Statistics Section, Statistics and Survey Division, Ministry of Agriculture and Forestry, was made at the Second Japan-United States Tuna Conference held at Tokyo in October 1962. Oka was a member of the Japanese delegation on Committee I, which discussed current trends in tuna production and forecasts for the tuna resources, expanded utilization of tuna fisheries, and measures to improve bilateral exchange of current information.

The text of the speech as translated from Japanese follows:

"Introduction: Statistics on fisheries have been considerably improved and expanded in Japan after World War II, but the users of statistics in our country are still clamoring for improvement. We are therefore continuing our efforts to fulfill this need. Particularly, in recent years, we have made progress in compiling comprehensive statistics for the agricultural and fishing industries. We are making an effort to compile fishery statistics which would include, in addition to catch data, general information on fish prices, profits and expenses of fishery management units, and on the living standards of the people engaged in fishery.

"In Japan, there are an extremely large number of small-scale coastal fishery operators, and they make up 90 percent of all management units. Even in the case of the tuna fishery, which is one of the larger distant-water fisheries, the small coastal fishery operators make up one-third of the management units. Production of these small coastal fishery management units is naturally small, but the improvement of their operations is an important domestic problem in Japan. Therefore, there is a need for compiling, in general, similar types of statistics for the coastal fishery. Moreover, with the exception of the census survey, statistical research for fishery, like that for agriculture, is almost entirely undertaken by the national statistical survey agencies. In these national statistical investigations, data requested by local autonomous bodies, such as prefectures, must be provided to a certain extent also.

"As can be expected, the above-mentioned situations contribute to abundance in kinds of fishery data. Moreover, the collection of such data requires a large staff of workers due to the fact that there are very many places and numerous species of fish to be investigated. Consequently, it is possible that we are not compiling comprehensive statistics for the important fisheries, particularly the tuna fishery.

"In our investigation of important fisheries, we are presently studying the possibility of confining our work areas to principal fish landing ports and establishing a system whereby only certain important items can be investigated, with special rapidity and accuracy, and promptly reported. At the same time, we also hope to make use of all reliable data that can be administratively collected through the Fisheries Agency, such as data from the mothership-type fishery and those fisheries involving landing of catches in foreign countries.

"Before proceeding with the explanation of investigation methods used in collecting data for tuna catch statistics, as background information I have briefly described the changes that are taking place in the compilation of fishery statistics in Japan. I would like to explain just one more item concerning tuna fishery statistics, which I believe will facilitate the understanding of investigation methods used in Japan for the compilation of tuna catch statistics.

"At the present time, the following kinds of fishery statistics are being collected:

I. Tuna Statistics:

"A. Catch statistics (quantity of catch or landing, actual operational units, number of vessel trips, number of days per trip). These data are obtained from the following sources:

Japan (Contd.):

- "1. Domestic marine fisheries (surveyed by the Statistics and Survey Division, Agriculture and Forestry Ministry).
- "2. Factoryship-type fisheries (each vessel is investigated by the Fisheries Agency).
- "3. Vessels based at foreign ports (each vessel is investigated by the Fisheries Agency).
- "4. Vessels operating in the Atlantic Ocean (each vessel is investigated by the Fisheries Agency).
- "B. Fishery census (management units, number of vessels in operation, vessel crews at peak of fishing season, number days fished, number of men engaged in fishing operations, etc.).
- A national fishery census survey is conducted every ten years by the Ministry of Agriculture and Forestry and by government agencies in prefectures, cities, towns, and villages.
- "C. Management income and expense statistics (income, expenditure, assets, number of work days, etc.).
- This survey is conducted by the Statistics and Survey Division and by the Fisheries Agency both of the Ministry of Agriculture and Forestry, fishery schools, and fishery cooperative associations, but the data are inadequate and generally unusable.
- "D. Fish prices (average prices paid or prices most frequently paid at production and consumer centers).
- Data compiled by the Statistics and Survey Division, Ministry of Agriculture and Forestry, and market organizations.
- "E. Classification of use at landing places, fresh fish distribution network, quantity of processed fish. (Note: Collection of data on classification of use was started in 1962.)
- Data compiled by the Statistics and Survey Division, Ministry of Agriculture and Forestry, and fishery products inspection associations.
- "F. Consumption statistics (quantity and value of purchases).
- Data compiled by the Statistics and Survey Division of the Ministry of Agriculture and Forestry, Welfare Ministry, and the Statistics Bureau of the Prime Minister's Office.
- "G. Trade statistics (volume and value of trade).
- Data compiled by the Ministry of Finance and the Ministry of International Trade and Industry.

"II. Structure of Organizations Collecting Tuna Catch Statistics:

"As previously stated, the Statistics and Survey Division of the Ministry of Agriculture and Forestry conducts most of the statistical investigations for the tuna fishery. This Division not only compiles various fishery statistics, but also conducts statistical investigations for the agricultural and livestock industries. The organizational structure of this Division is as follows:

"Central Office:

Statistics and Survey Division, Ministry of Agriculture and Forestry.

Number of offices: Five departments and three sections.

Staff: 500 (50 concerned with fishery statistics).

"Prefectural Offices:

One statistical and survey office in each prefecture, each with six departments.

"Hokkaido:

Four statistical and survey offices, each with six departments

Total number of regional (Prefectures and Hokkaido) fishery offices: 49.

Total staff members of regional fishery offices: Approximately 4,000 (287 concerned with fishery statistics).

Town and Village Offices: One in each fishing town or village.

Total number of offices: 787.

Total staff members of town and village offices: Approximately 8,500 (826 concerned with fishery statistics).

"The staff members, who are all experienced in statistical work, are given opportunities for on-the-job training. About 250,000 private individuals familiar in fisheries are assisting in the Government's statistical research on a part-time basis.

"Statistical investigations for the tuna fishery are undertaken by the following disciplines of the Ministry of Agriculture and Forestry:

"Central Office:

Fishery Catch Statistics Section, Fishery Statistics Department, Statistics and Survey Division.

"Prefectural Offices:

Fishery Catch Subsection, Fishery Catch Statistics Section, Fishery Statistics Department, Statistics and Survey Division.

"Coastal Suboffices:

Chief, Fishery Statistical Office.

"Statistical investigation of the tuna fishery was authorized in 1952 by the Director, Administrative Management Agency, in accordance with Designated Statistics Ordinance No. 54, based on

Japan (Contd.):

the Statistics Law of Japan, and, as such, tuna statistics are included within the list of important fishery statistics.

"III. Investigation Methods for Compilation of Tuna Catch Statistics:

"A. Summary:

"Statistical investigation methods for the tuna fishery, as well as those for other fisheries, have undergone several changes, each change bringing about a modification of the investigation system.

"In Japan, statistical investigation of fisheries on a national scale was started in 1870. Subsequently, the mayors of cities, towns, and villages submitted annual statistical reports to the Statistics Section of the Ministry of Agriculture and Forestry through the prefectural governor. This system continued until the termination of World War II. Statistical agents in cities, towns, and villages collected data on quantity of fish catch and on number of people engaged in fishery by different methods, and tabulated these data on the report form prescribed by the Ministry of Agriculture and Forestry. However, under this system of collecting data, wherein the methods of collection were never criticized, variations occurred in the tabulated catches, which were questionable, so, to avoid this situation, the regional statistical offices began to submit to the Ministry figures showing less fluctuations than those which actually existed.

"After the termination of World War II, fishery products were placed under a ration system and all local catches were delivered to a central point for distribution to consumer centers. Fishery associations were required to submit monthly production reports to the Government, and on the basis of these data, the Government compiled fishery statistics. However, for statistical purposes, the reports submitted by the fishery associations, which were compiled for business purposes, were unsuitable since they lacked statistically important data, they were submitted too late, or contained numerous omissions and incomplete data, due to administrative defects.

"In 1950, the Fishery Statistics Section was established in the Statistics and Survey Division of the Ministry of Agriculture and Forestry, and experts in fishery statistics were assigned to all the regional statistical survey offices, as well as suboffices. This marks the beginning of the fishery statistical investigation system as it generally exists today.

"Under this system, in the beginning a method was instituted whereby a few

incoming vessels were selected for sampling, and their catches actually inspected or determined by interviewing the vessel master. However, this method was subsequently found to be impractical, so it was discontinued and substituted by another method of tabulation whereby records of fish unloaded and received by fishery cooperative associations and fish wholesale markets were checked against catch data obtained from actual inspection of certain selected vessels or against data obtained from catch report forms issued to certain vessels. At present, this method is also virtually in disuse.

"B. Present method of investigation:

"1. Catch information:

"Depending upon quantity of fish unloaded at a port, the statistical agent conducts investigations under one of the following two methods, which are the only methods being employed in the compilation of tuna catch statistics.

- "a. At major fishing ports, examines and tabulates all fish landing records (sales slips).
- "b. In fishing villages, estimates catch by interviewing members of fishery cooperative associations.

"Under the interview method, there are two methods by which fish landings are investigated. They are:

"(1) In cases where it is not possible to calculate catch by tabulating every sales ticket, an interview is conducted to determine numbers and kinds of vessels engaged in actual fishing. With this as a basis, a certain number of fish tickets are sampled to determine catch composition by kinds of vessels, and from these two sets of figures, total catch is estimated for the different species by kinds of vessel.

"(2) In the case where sales slips are not employed in tabulating catch statistics, an interview is conducted to determine numbers and kinds of vessels engaged in actual fishing. Then, with this as a basis, a fishing association within a fixed area is selected for sampling and interviews conducted to obtain an estimate of total catch by species and by kinds of vessel.

"There are 3,000 fish landing ports in Japan. Of these, 150 ports are checked

Japan (Contd.):

by the sales ticket system, as described in "a." Of these 150 ports, about 30 handle tuna. Fishing ports investigated under the interview system, as described in "b(1)" and "b(2)," number close to 2,800, of which about 10 percent handle tuna.

"Recently, sales slips have begun to be used at all landing ports. In the case of the tuna fishery, statistical workers are employing the sales slip tabulating method described in "b(1)" more widely than the straight interview method described in "b(2)" above.

"Fish landing records are prepared by licensed fishery cooperative associations or fish markets at time of unloading, based on mutual agreement with vessel owners. These records, which are also used to compute fishermen's shares, are reliable, but the statistical workers make further checks by comparing them with other data to verify their accuracy.

"The fishery cooperative associations are public enterprises established in fishing villages. They not only undertake such functions as loans, sales, purchases, and rental of equipment, but also conduct guidance and adjustment for fishermen engaged in the coastal fishery. Organized on the village level according to type of fishery, the fishery cooperative associations always have detailed information on production. However, at times catch data provided by the associations are further studied by statistical workers by comparing them with other data.

2. Number of vessels in operation, number of trips, and number of trip days:

"The number of vessels fishing is obtained by interviewing vessel owners. At times, vessels which normally return to large ports enter prefectural ports, where vessel operations are not tabulated. (In 1961, a total of 2,629 tuna vessels were engaged in fishing.)

"In tabulating number of trips, the number of fishing vessels entering landing ports is recorded. At major landing ports, this is done by tabulating sales slips. In fishing villages, this data is obtained by interviewing fishery cooperative associations and from reports submitted by part-time statistical agents. (In 1961, the number of trips made by tuna vessels totaled 27,000.)

"The number of trip days is computed by multiplying the number of days per trip with the number of trips. At large fish landing ports, this information is

obtained by interviewing masters of incoming vessels or fish buyers at the market. (In 1961, the number of trip days for tuna vessels totaled 380,000 days.)

"Mention should be made at this point concerning statistical tabulations by fishing grounds. In addition to those statistics which are tabulated by large areas, detailed catch statistics by fishing area have been specially prepared for squid, saury, and mackerel. We have compiled catch statistics by five-degree areas for tuna vessels (over 30 gross tons) which operated during the period between April 1961 and March 1962. In April 1962, we compiled statistics for the first half of fiscal year 1961 (April 1961-March 1962) and are now tabulating the data for the second half of 1961. . . ."

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PACKER'S VIEWS ON TUNA PROBLEMS:

The Executive Director of Japan Export Tuna Packers Association was interviewed on January 12 by a reporter of the Japanese fisheries periodical, *Suisan Tsushin*, concerning problems confronting the Japanese tuna canning industry. His views on yield, inspection standards, sales prices, supply of raw materials, and on marketing are reported to be substantially as follows:

Yield: The standard yield of Japanese summer albacore tuna is 50 cases (48 7-oz. cans) per metric ton of albacore with fish averaging 18 kilograms (39.6 lbs.) in weight. Yield of winter albacore depends upon the quality of fish, but is based on the average fish weight of 20-22 kilograms (44-48.4 lbs.).

It is common knowledge that . . . in terms of quantity, yield in the United States is much higher than that in Japan. Extent of this difference in yield depends on type of raw product and processing method, but it can be assumed that United States packers pack at least 5-6 more cases of canned tuna per ton of raw fish than Japanese packers.

If United States packers can pack 62 cases of canned tuna per ton of raw tuna, then the difference in Japanese and United States yield would widen to 12 cases per ton of fish. . . . There is no doubt whatsoever that Japanese packers can obtain much higher yields than United States packers if they were to follow the American packing method and not discard any meat portions in the packing process.

Inspection Standards: In Japan, inspection standards compel tuna packers to improve the quality of their pack. The spirit of the inspection standards, which was established before World War II for albacore tuna, even when they sold at extremely low prices, is still in existence today. . . .

The strict inspection standards applied in Japan seem to be out of line in these days when cost of raw materials is so high. Therefore, they should be revised and brought in line with standards in the United States. . . .

Export Prices: An objective appraisal of the quality of Japanese canned tuna indicates that a suitable price for Japanese tuna packed in brine would be about \$18 per case (48 7-oz. cans). Before World War II, Japanese canned tuna was retailing in the United States at almost the same price as well-known United States brands. Since Japanese canned tuna is very high in quality and its production regulated, we would like to see it exported at prices at least comparable with name American brands.

Japan (Contd.):

In the early postwar period, Japanese canned solid-pack tuna could be exported only at prices of chunk-style packs. However, due to subsequent efforts of Japanese exporters, coupled with the rising cost of raw materials, Japanese canned tuna began to sell at prices comparable to, or even higher than, United States private label packs. We hope that the exporters will exert still greater efforts to enhance Japanese canned tuna prices.

Supply: A study of the tuna supply situation reveals the existence of a constant supply shortage of albacore tuna in the world market. The demand for albacore tuna is very strong in Europe and the United States. However, price disruption in Japanese frozen tuna exports to the United States occurs about once or twice a year, without fail. . . Also, prices of frozen tuna exported from Japanese overseas bases are said to be lower than those exported from Japan proper, although we do not have detailed information concerning this matter. It would be very unfortunate if those two factors are contributing unnecessarily to the deterioration of the United States tuna market.

United States Canned Tuna Market: In the United States, canned tuna retail prices are relatively stable during the months of September, October, and November. Wholesale prices may fluctuate in certain regions of the United States where promotional sales are conducted. Those sales are conducted regularly. It seems that the prices of Japanese canned tuna sold in the United States still leave good margins, as calculated from c.i.f. prices. If those extra margins could be properly used to expand markets for Japanese canned tuna, that would indeed be desirable.

Sales Policy: Although every effort is being made to improve sales methods, Japanese canned tuna probably can be exported at better prices and in greater quantities if Japanese packers and exporters would fully apply the agreement they have on canned tuna sales (50-50 division of export quota). At this time when the Japanese Government is viewing with concern restrictions placed on tuna by GATT (General Agreement on Tariffs and Trade), which the Government considers excessive, we must not, under any circumstances, allow the United States canned tuna import quota (at the 12½-percent rate of duty) to remain unfulfilled. (Suisan Tsushin, January 14, 1963.)

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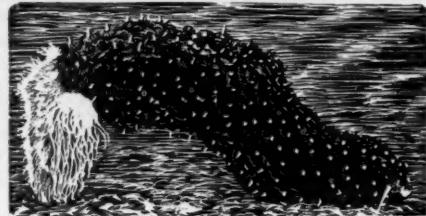
FISHING FOR TUNA IN SOUTH PACIFIC OCEAN PROMISING:

The Japanese fishing firm which planned to build tuna fishing bases on both Tahiti and New Caledonia in the South Pacific has already obtained permission from the French and local governments, and also submitted a petition to the Japanese Fisheries Agency for approval. The plan was being studied by the Japanese Government and the general consensus was that permission to build the base would be granted.



Eel

Tuna including skipjack and shark, are abundant around New Caledonia. The coastal fisheries in the area are promising for lobster, shrimp, crab, eel, oyster, and sea cucumber, in addition to pearl shells.



Sea cucumber.

As a result of a 30-day exploratory operation by Chiba Prefecture's guidance ship Boso Maru, it was determined that fishing in adjacent waters of New Caledonia is extremely favorable.

A total of 1,189 tuna were caught during a 15-day operation with an average catch of 99 tuna a day in an area designated "A" Area (off Candy Island, Australia). The breakdown



Yellowfin tuna

was 50.7 percent yellowfin, 21.5 percent striped marlin, 6.4 percent albacore and big-eyed. "B" Area (northwest of New Caledonia), for a 4-day operation yielded 113 tuna a day on the average for a total catch of 453 tuna. The breakdown was 63.1 percent albacore, and 18.1 percent yellowfin and black marlin. "C" Area (west of the New Hebrides Islands to New Caledonia) yielded 128 tuna a day on the average for a total of 1,408 tuna during an 11-day operation. The breakdown was 47.9 percent yellowfin, 42.2 percent albacore, black marlin, and others. (Japanese newspaper, December 31, 1962.)

Note: See *Commercial Fisheries Review*, January 1963 p. 117; August 1962 p. 82; June 1962 p. 62.

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Japan (Contd.):

TUNA FISHING FORECAST FOR EASTERN PACIFIC, JANUARY-FEBRUARY 1963:

The Kanagawa Prefecture Fisheries Experimental Station released its forecast of tuna fishing for January and February 1963 as follows (tonnage indicates long-line catch per 1,800 hooks):

Central Eastern Pacific (20° N. lat.-10° S. lat. east of 150° W. long.): A good fishing period in the sea area 5°-10° N. lat., 110°-130° W. long. A heavier catch is expected in January at the rate of 5.0 metric tons (0.3 ton of yellowfin, 4.5 tons of big-eyed, and 0.2 ton of black marlin). February rate will be less than January at 3.5 tons (consisting of 0.2 ton of yellowfin, 3.2 tons of big-eyed, and 0.1 ton of black marlin).

Also, in the sea area west and east of the sea area, catch will be less at 1.5 tons (0.2 ton of yellowfin, 1.0 ton of big-eyed, and 0.3 ton of black marlin) in the western part. A rate of 2.3 tons (comprised of 0.3 ton of yellowfin, 1.8 ton of big-eyed, and 0.2 ton of black marlin) is expected in the eastern section. Catch and fishing ground will differ between January and February in the sea area from the equator to 10° S. latitude. In January, in the sea area from the Marquesas Islands to 120° W. long. the catch rate will be 4.5 tons (1.1 tons of yellowfin, 3.0 tons of big-eyed, and 0.4 ton of black marlin); in the sea area somewhat south of the area between 100°-120° W. long. the black marlin catch will be less compared with the western area and the catch rate will be 1.2 tons of yellowfin, 3.0 tons of big-eyed, and 0.3 ton of black marlin. In February, in the area from the equator to 7° S. lat., the Marquesas Islands to 120° W. long., big-eyed will be caught; south of the area 7°-10° S. lat., yellowfin, big-eyed, and albacore will be caught. The catch rate is estimated at 3.6 tons (0.9 ton of yellowfin, 2.3 tons of big-eyed, and 0.4 ton of black marlin) for the area of the equator -7° S. lat., 130°-150° W. long. In the area to the east, between 120° and 130° W. long., the catch rate will be 4.5 tons (1.1 ton of yellowfin, 3.0 tons of big-eyed, and 0.4 ton of black marlin).

In the area 7°-10° S. lat., 120°-150° W. long., a catch rate is expected of 4.4 tons (comprised of 1.3 tons of yellowfin, 1.6 tons of big-eyed, and 1.5 tons of albacore). Also, much big-eyed will be hauled in the area between 100°-120° W. long. with a rate of 4.2 tons (0.3 ton of yellowfin, 3.4 tons of big-eyed, 0.3 ton of albacore, and 0.2 ton of black marlin). The catch rate in that area is decreasing year after year and this year it is expected to be about 10 percent less than last year.

Catches of big-eyed and striped marlin are expected around the Galapagos Islands. In January, the catch rate will be 4.5 tons (4.0 tons of big-eyed and 0.5 ton of striped marlin). In February, the rate probably will be 4.7 tons (comprised of 3.3 tons of big-eyed and 1.4 tons of striped marlin).

Southeastern Pacific (south of 10° S. lat., east of 150° W. long.): Catch west of 125° W. long. in January will be at the rate of 4.0 tons (2.2 tons of big-eyed and 1.8 tons of albacore); in February, a rate is expected of 4.0 tons (1.1 tons of yellowfin, 1.5 tons of big-eyed, 1.1 tons of albacore, and 0.3 ton of black marlin). In the area from 105°-125° W. long. in January the rate will be 3.9 tons (0.5 ton of yellowfin, 2.8 tons of big-eyed, and 0.6 ton of albacore); in February the rate will be 3.7 tons (consisting of 0.6 ton of yellowfin, 2.5 tons of big-eyed, and 0.6 ton of albacore. East of 105° W. long. in January, the catch rate is estimated at 4.5 tons (1.8 tons of big-eyed and 2.7 tons of striped marlin) and in February the rate will be 5.0 tons (1.0 ton of big-eyed, 4.0 tons of striped marlin).

Although the sea area south of 13° S. lat. is a fishing ground for albacore and black marlin, the heavier the catch of albacore, the closer fishing will be to the Tahiti Islands with a catch rate of 3.8 tons (2.6 tons of albacore and 1.2

ton of black marlin. Around 125° W. long. in January and in February, the catch rate is estimated 3.5 tons (comprised of 0.5 ton of yellowfin, 0.2 ton of big-eyed, 2.2 tons of albacore, and 0.6 ton of black marlin). Around the Tahiti Islands in January, the catch rate of 3.8 tons will consist of 0.5 ton of yellowfin, 1.1 ton of albacore, and 2.2 tons of black marlin; and in February, a catch rate of 3.3 tons will be 1.8 tons of albacore and 1.5 tons of black marlin. (Japanese periodical, December 27, 1962.)

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YAZU FISHERY LANDINGS, JANUARY-NOVEMBER 1962:

At Yaizu (leading tuna fishing port) in November 1962, a total of 8,441 metric tons of fish was landed, valued at \$2,621,250. Landings in November 1962 were down 5 percent from the previous year, but because of higher ex-vessel prices, the value of the landings was up 24 percent. Included in the November 1962 landings were 5,000 tons of tuna.

Landings at Yaizu for January-November 1962 of 123,922 tons were valued at \$33.3 million ex-vessel as compared to 117,121 tons valued at \$29.5 million for the same period in 1961. (Suisan Keizai Shimbun, December 29, 1962.)

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FISH MEAL OPERATIONS:

Japanese fish meal factoryship operations in the eastern Bering Sea are expected to be reorganized drastically in 1963. The Japanese fishing company, which pioneered the development of that fishery, plans to terminate its meal operations in the Bering Sea and will withdraw its two meal factoryships (Kinyo Maru, 9,373 gross tons; Renshin Maru, 14,094 gross tons) from that fishery. The large fishing company that operates the meal factoryship Soyo Maru (11,192 gross tons) and the meal-oil factoryship Tenyo Maru (11,581 gross tons) and still another firm that operates the meal factoryship Gyokuei Maru (10,357 gross tons) are reported to be planning on curtailing their meal operations and concentrating on frozen fish production.

Reportedly, the decline in bottomfish resources in the eastern Bering Sea and competition from low-priced Peruvian meal have made meal operations in the eastern Bering Sea unprofitable.

The first of the three firms referred to above is said to have suffered large losses in 1962 from its Bering Sea meal operation. The firm that owns the Gyokuei Maru re-

Japan (Contd.):

portedly will assume the first firm's liability, totaling close to 3 billion yen (US\$8.3 million) and take over the management.

Under the reorganization, there are plans to expand the Renshin Maru's production of frozen fish off Angola and on continuing the mothership-type king crab operations in the eastern Bering Sea and the Okhotsk Sea. As for the Kinyo Maru, the firm that has taken it over plans to work out an agreement with a South American meal-producing nation whereby fishing vessels of that country would deliver their catches to the Kinyo Maru, which would be anchored offshore, for processing into fish meal. (Suisan Tsushin, January 12 & 17; Suisan Keizai Shimbun, January 13, Shin Suisan Shimbun, January 14, 1963.)

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FISH MEAL IMPORTS:

The Japanese Government early in January 1963 approved the importation of 20,000 metric tons of Peruvian fish meal at a c.i.f. price of \$136 per ton. This represents a price increase of \$10 per ton since December 1962. (Shin Suisan Shimbun Sokuho, January 17, 1963.)

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FISHERIES AGENCY'S 1963 BUDGET:

The Japanese Government has prepared budget estimates for fiscal year 1963 (April 1963-March 1964), which were presented to the Diet (Parliament) when it reconvened in late January. Budget estimates for the Fisheries Agency, Ministry of Agriculture and Forestry, total ¥17,064 million (US\$47.4 million), an increase of nearly ¥1.9 billion (\$5.3 million), or 12.5 percent, over the previous year's regular fishery budget of ¥15,166 million (\$42.1 million).

For the program on "biological research related to international fisheries," the Fisheries Agency is requesting an increase of 44.5 million yen (\$124,000). This increase is to be used primarily for carrying out an extensive tuna research program involving the use of about 50 prefectural research and training vessels, with emphasis to be placed on the investigation of tuna resources, rather than on the development of new tuna fishing grounds. (Nihon Suisan Shimbun, January 11, 1963.)

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BUDGET FOR PROMOTION OF AGRICULTURAL AND MARINE PRODUCTS EXPORTS IN 1963:

Following conferences with the Ministry of Finance, the Japanese Ministry of Agriculture and Forestry announced on January 9, 1963, that a budget of 148,680,000 yen (US\$413,000) has been approved for the promotion of exports of agricultural and marine products for fiscal year 1963 (April 1963-March 1964). The export promotion program will be administered by the Japan Export Trade Promotion Agency (JETRO), a quasi-governmental body.

JETRO's proposed program for FY 1963 includes stationing, for the first time, an agent at San Francisco, whose responsibility will be to analyze market trends of agricultural and marine products in the western United States, primarily in California. The Japanese Government is contributing 75 percent of the cost (2,220,000 yen or \$6,167). As for other areas, like New York City, Hamburg (Germany), and Hong Kong, JETRO plans to continue to maintain personnel in those areas.

JETRO plans to continue surveys on products like canned tuna and canned saury, as in past years. Concrete plans for conducting those surveys are to be drafted by April 1963, following consultations with industry. A budget of 15,875,000 yen (\$44,100) is being allotted for all market surveys, with the Government contributing the full sum.

In the field of promotion, JETRO plans to conduct an advertising campaign in France to promote the sale of pearls. This is a new program, and the Government is contributing half of the cost, or 5 million yen (\$13,890). A similar amount is being contributed by the Government for sales promotion in England.

Promotion of marine products, like canned tuna and frozen tuna, is to be continued, with concrete plans to be formulated by April 1963. (Suisan Keizai Shimbun, January 10, 1963.)

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SARDINE CANNING TRENDS, JANUARY 1963:

Sardine canners in the Sanin area of Japan on the Japan Sea early in January 1963 were reported to have begun buying sardines being landed in the Sanriku area at \$30-\$38 per ton ex-vessel. As of early January, canned sar-

Japan (Contd.):

dines packed in the Sanriku area were equally divided between domestic use and export. Almost all the export pack (mostly No. 1 cans in tomato sauce) was of high quality and good enough to pass export inspection for the United States.

Exporters were of the opinion that exports of canned sardines would be resumed in January, and an estimated 100,000 cases were expected to be exported.

Sardine packing along the Sanriku coast was progressing smoothly toward the end of 1962 and some 30,000 cases packed for export had been consigned to the joint sales company according to a January 10 report. Almost 20,000 cases had passed inspection for export to the United States. (Suisan Tsushin of January 4 and 10, 1963.)

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TRAWLER FISHING IN NORTHWEST ATLANTIC LANDS FIRST TRIP AT ST. PIERRE:

The Japanese stern-trawler Aoi Maru No. 2, which left Nagasaki in August 1962 and began fishing off Newfoundland about mid-October, landed its first trip of frozen fish either late in December last year or early January this year at St. Pierre for transshipment to the United States. The catch, consisting of about 657,000 pounds of round and dressed fish, arrived in Gloucester, Mass., on January 15, 1963 (see table).

Japanese Stern-Trawler Catch from Northwest Atlantic Grounds Landed at St. Pierre and Transshipped Frozen to Gloucester, Mass.	
Species	Net Weight
Cod	Pounds 34,452
Haddock	127,952
Flounder	274,296
Sole	41,360
Hake	128,586
Halibut	4,268
Ocean perch	15,796
Pollock	3,575
Lobster	572
Shrimp	88
Miscellaneous	26,098
Total (14,871 pkgs.)	657,043

Note: Fish were frozen in so-called "logs" and wrapped in burlap. The cod, haddock, hake, and pollock were headed and gutted (dressed); most of the remainder was round.

A report by the Japanese periodical, Suisan Tsushin of December 31, 1962, stated that since the vessel arrived on the fishing grounds (Grand Banks) the catch of cod was

not up to expectations. However, according to the periodical, the vessel was expected to have a full load by the end of 1962.

The same source reports that with better weather conditions the vessel expects to survey a wide area east and north of Newfoundland. The Japanese sponsors of the expedition feel that another trawler is needed to cover the wide area to be investigated and will probably request permission to send another vessel to aid the Aoi Maru No. 2 to investigate the bottomfishing potential in the Northwest Atlantic.

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BOTTOMFISH MOTHERSHIP ASSOCIATION FISHING PLANS IN NORTH PACIFIC FOR 1963:

The Japanese Northern Waters Bottomfish Mothership Association, composed of the 16 companies operating bottomfish fishing fleets in the Bering Sea, North Pacific Ocean, and the Okhotsk Sea, met on December 17, 1962, in Tokyo, to discuss 1963 bottomfish operations. At the meeting, the Association agreed to restrict its 1963 operations to a total of 25 motherships and 346 catcher vessels, and submitted a final proposal to that effect to the Fisheries Agency. The proposal represents an increase of 52 catcher vessels over actual 1962 operations, when 294 catcher vessels were employed, according to the Japanese periodical Suisan Keizai Shimbun, December 18, 1962.

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BERING SEA BOTTOMFISH LANDINGS, 1961-62:

The bottomfish landings (including shrimp but exclusive of king crab) of Japanese mothership fleets operating in the Bering Sea in 1962 were down about 20 percent from the

Japanese Bering Sea Bottomfish Landings, 1961-62 ¹		
Species	1/1962	1961
Flatfish . . . . .	.... (Metric Tons)	
Flatfish	346,553	453,963
Halibut	9,942	11,005
Cod	9,642	6,764
Alaska pollock	59,455	24,404
Silver cod (sablefish)	28,340	26,231
Rockfish ²	12,618	10,543
Shrimp	16,797	10,255
Herring	9,942	72,260
Miscellaneous	3,655	5,719
Total	496,944	621,114

¹Preliminary.

²Statistics from various Japanese sources vary as to the landings of rockfish in 1962.

Japan (Contd.):



A Japanese trawler fishing bottomfish for the mothership in the Bering Sea.

previous year. The decline was due mainly to a cutback in the number of mothership fleets operating during that year. The Japanese Fisheries Agency licensed only 23 mothership fleets to fish for bottomfish in the Bering Sea in 1962 as compared to 33 motherships licensed in 1961.

In 1962, there was a sharp decline in the Japanese Bering Sea catch of herring (down 86.2 percent) and flounder (down 24.0 percent). The decline was offset partly by an increase in the catch of Alaska pollock (up 143.6 percent), and shrimp (up 63.8 percent).

Area E was the main fishing ground for the vessels serving the five fish meal factoryships in the Japanese Bering Sea bottomfish fleet. Fish meal production was hampered by the small size of the flatfish caught as well as by the decline in the total flatfish catch. The increase in the catch of Alaska pollock, which was used only for fish meal, did not offset the decline in the flounder catch. The Japanese Bering Sea fish meal factoryships were reported to have lost money in 1962.

Note: See Commercial Fisheries Review, February 1963 p. 76; August 1962 pp. 74-76; and June 1962 p. 56.

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FROZEN HALIBUT EXPORTS:

Japanese exports of frozen halibut to the United States as of mid-December 1962 a-

mounted to some 2,000 short tons during the 1962 Japanese fiscal year (began April 1, 1962). Of that amount, 95 percent was steaks. It is estimated that another 700 or 800 metric tons (almost all dressed) were exported to Great Britain. Exports to Britain in 1962 were more than five times as much as the previous year. Exports to the United States in 1962 were twice as much as in 1961.

Export c.i.f. prices to the United States for steaks were a maximum of 48.5¢ a pound and averaged 40¢ a pound--7-10¢ higher than the previous year. Prices for dressed halibut to Britain were 2 shillings 2-3 pence (30-31 U. S. cents) a pound c. & f.--2-3 pence (2-3 cents) higher than the previous year.

Some 500 tons are reported in stock in Japan, but purchases are expected for the Lenten season. Export demand for frozen halibut was sluggish in December 1962.

The price of broadbill swordfish started to drop in November 1962 and towards the end of December was 1¢-2¢ per pound cheaper on the average. Inasmuch as it is reported that broadbill swordfish long-line fishing in waters off the east coast of the United States is being developed, many in Japan are inclined to feel that it will take some time for the market to recover. (Suisan Tsushin, December 26, 1962.)

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Japan (Contd.):

PEARL ESSENCE IMPORT DUTY REDUCED:

The Japanese import duty on pearl essence (Tariff item 3209-2) will be reduced from 10 to 8 percent ad valorem as a result of the United States-Japanese compensatory trade agreement announced December 31, 1962.

In the agreement, Japan granted tariff concessions to the United States in compensation for the modification by Japan of a number of concessions previously made under the General Agreement on Tariffs and Trade (GATT).

During 1961, Japan imported pearl essence valued at \$606,000 from the United States.

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TRAWLING OPERATIONS IN DISTANT WATERS:

As of early 1963, Japan had 27 large trawlers (12 belonging to one firm and 10 to another) operating off the west coast of Africa, north of Australia, and the Northwest Atlantic. By the end of 1963, the Taiyo Maru No. 3 (1,500 gross tons) will be completed and join others in the Atlantic. In addition, four new large trawlers of the 2,800- to 3,500-ton class are planned to be built beginning in 1964. Besides a trawler of the 2,500-ton class to be completed in August 1963, the same firm has revealed its plan to build two more of the same type.

The competition among Japanese trawlers is becoming evident at operational bases in Ghana, Spain, Italy, Greece, Las Palmas, and Capetown. There are signs of decreasing catches per vessel.

There is a move to dissolve the current "Sansuikai" organization comprising seven overseas trawling companies and in its place organize an adjustment organization of the industry similar to the Northern Sea Mothership Council (organization of owners of salmon-trout motherships of northern seas). Establishment of such an organization by the end of 1963 is the goal. The plan is to assimilate organizations in the industry having legal backing to adjust export prices and destinations, catch, regulation of fishing grounds, study and research in resources, and others. (Japanese newspaper, January 4, 1963.)

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TRAWLER TO EXPLORE WATERS SOUTH OF ALASKA PENINSULA:

Japan announced at the Ninth Annual Meeting of the International North Pacific Fisheries Commission (INPFC) held in Seattle in November 1962 its intention of sending one integrated trawler during the 1962/63 winter to explore the waters south of the Alaska Peninsula. The January 13, 1963, issue of the Japanese periodical Suisan Keizai Shimbun reported that Japan planned to dispatch the 1,454-ton stern trawler Akebono Maru No. 51. The vessel was scheduled to depart from Hakodate, Hokkaido, on January 18 for the Gulf of Alaska, where it will conduct trial fishing for shrimp, redfish, cod, and sablefish. Its production target is 744 metric tons of bottomfish. The trawler is scheduled to return to Kurihama, Kanagawa Prefecture, on April 12.

Under the proposal of intentions submitted by the Japanese National Section at the 1962 INPFC Meeting, the Akebono Maru is expected to avoid areas of concentration of halibut, return to the sea any halibut caught incidental to its operations, avoid fixed gears (such as king crab pots or halibut long lines) fished by Canadian or United States fishermen, and to submit a record of its operations to the INPFC.

According to an announcement made by the Japanese Fisheries Agency, a U. S. Bureau of Commercial Fisheries fishery research biologist will board the vessel before its departure from Japan as an observer for the United States. (Suisan Keizai Shimbun, January 13, 1963.)

The Akebono Maru reportedly will operate in the North Pacific Ocean north of 50° N. latitude and east of 170° W. longitude, according to the following cruise plan.

Date	Area of Operation	Position (Longitude W.)	Species to be Explored
Feb. 6-11 . . .	So. of Unimak Is.	164°-165°	Redfish
Feb. 12-20 . . .	W. of Shumagin Is.	159°-161°	Shrimp
Feb. 23-Mar. 5	Off Kodiak Is.	152°-155°	Cod
Mar. 6-11 . . .	No. of Portlock Bank	149°	Redfish
Mar. 12-17 . . .	SW. of Yakutat Bay	141°-142°	Sablefish & Redfish
Mar. 18-21 . . .	Off Kodiak Is.	152°-155°	Cod
Mar. 24-Apr. 2	W. of Shumagin Is.	159°-161°	Shrimp

* * * * *

LARGE STERN TRAWLER BEING BUILT:

A Japanese fishing firm plans to construct a 3,000-ton stern trawler in 1963. The trawler is to be built at a total cost of ¥700 million (US\$1.9 million), with construction to be started in the spring. Target date for completion is mid-September. (Suisan Keizai Shimbun, December 22, 1962; Nihon Keizai Shimbun, January 15, 1963.)



Kuwait

FISHERIES SURVEY BY FAO EXPERT:

The Food and Agriculture Organization (FAO) has assigned an FAO fisheries consultant to the Government of Kuwait for three months. In January 1963, the FAO expert arrived in Kuwait to survey the fisheries in the area and to make recommendations for

Kuwait (Contd.):

their development. He carried out similar assignments as an FAO expert in 1962 in Mauritania and in Nyasaland. (Food and Agriculture Organization of the United States, Rome, January 25, 1963.)



Norway

FISHERMEN STRIKE FOR HIGHER SUBSIDIES:

A fisherman's strike for higher Government subsidies in 1963 began throughout Norway on January 1, this year. The strike as of the second week in January had little effect on consumer supplies, since retail stocks of fresh and frozen fish were high and January is an off-month for fishing. However, some fish-processing plants had begun to lay off workers and the Government feared that a prolonged strike could cause considerable unemployment in Northern Norway, with public works or other stop-gap local employment largely ruled out by the severe winter.

The conflict arose when the fishermen's organization (Norges Fiskarlag) demanded a 20-percent increase in income for 1963, estimated to require a total of 245 million kroner (US\$35.5 million) in Government subsidies on prices or equipment costs. The Government countered with a demand to defer negotiations until the spring, when they could be coordinated with the general round of wage and price negotiations in industry and agriculture; but the fishermen would agree only on condition that they be granted an immediate "transitional" increase of 10 percent (to 190 million kroner or US\$26.6 million). The Government rejected this demand, announcing that pending the spring negotiations the subsidies would be continued at the 1962 level of 99 million kroner (US\$13.8 million). Negotiations were reopened early in January, and there was hope of a compromise settlement before mid-January. (United States Embassy, Oslo, January 8, 1963.)

* * * * *

FISHERMEN'S STRIKE SETTLED:

The Norwegian fishermen's 9-day strike ended January 9, 1963, when negotiators reached an agreement. Fishing was quickly resumed because the fishermen's organization (Norges Fiskarlag) notified its 28,000

members to go back to work immediately. The settlement was subsequently approved by Government officials and the national committee of Norges Fiskarlag.

The settlement involved a transitional arrangement. Previous provisions for state subsidy to the fishing industry were to be prolonged for several months, with certain supplementary benefits added. Negotiations on a new subsidy agreement will be resumed in the spring of 1963. The Government will then consider a settlement with Norges Fiskarlag in conjunction with the other major settlements due to be negotiated in coming months. These will be conducted between trade unions and industry, and between the state and agricultural organizations. At issue are new price and subsidy arrangements for farmers and new management-labor contracts. (News of Norway, January 17, 1963.)



Okinawa

IMPORT LICENSES EAGERLY SOUGHT FOR JAPANESE TUNA VESSELS:

Since the recent notice by the Japanese Government permitting Okinawa to import tuna vessels amounting to 2,250 gross tons, orders for Japanese fishing vessels have poured in from Okinawan fishing companies. As soon as import licenses are issued by the Okinawan Government, orders for the entire tonnage are expected to be placed.

The vessels allocated to Okinawa are secondhand ones without Japanese tuna fishing rights, and talks between buyers and dealers are based on 700-, 500-, and 300-ton class vessels. Vessels of those tonnage classes have been used by the Japanese for tuna fishing in the Atlantic.

Okinawa may export frozen tuna to the United States and Europe. It is likely that Japanese exporters will handle the exports directly or indirectly and the market for Japan's frozen tuna exports may be affected. (Suisan Tsushin, December 31, 1962.)



Pakistan

SHRIMP TRAWLER FLEET EXPANDED:

A new addition to Pakistan's shrimp fishing fleet is the factory mothership Mahina which was scheduled to be handed over to her

Pakistan (Contd.):

owners some time early in 1963. Also, a number of small stern trawler-type shrimp fishing vessels were recently built for the Pakistan fishery, the latest from an Aberdeen, Scotland, shipyard. These were built primarily for fishing the west coast of Pakistan and adjacent areas in the Indian Ocean which have been found to be productive, and very favorable for shrimp-trawling operations. The impetus in building a new shrimp fishing fleet in Pakistan is largely attributed to the popularity and increasing demand for shrimp in the United States. Pakistan's shrimp exports to the United States during January–November 1962 were 2.7 million pounds, more than double the 1.3 million pounds exported in the same 11 months of 1961.

The *Mahia* is 1,220 gross tons and was formerly the *Sapele*, a cargo vessel operated by the Elder-Dempster Lines. She was delivered to a Norwegian shipyard during the summer of 1962 for conversion into a shrimp freezer vessel for a Pakistani firm in Karachi. Conversion of the vessel, as well as repairs, were in accordance with Lloyd's 100 A.1. class, and met the specifications and requirements of the Pakistan Government's Ministry of Communications (Directorate General of Ports and Shipping).

The vessel's over-all length is 224'5", has a length of 210' between perpendiculars, moulded breadth of 36'6", and a depth of 21'8" to upper deck. Her main engine is a 3-cylinder, triple-expansion steam engine manufactured in 1938. A new engine-room was constructed in the vessel for the installation of the increased number of auxiliaries needed for the various factory machines installed for handling and processing the catch. It has 2 auxiliary steam engines with 15 kVA generators, and also 2 auxiliary Diesel engines developing 150 b. hp. each at 1,250 r.p.m., and each directly coupled to a 110 kVA alternator of 220 volts d.c.

The refrigerating equipment in the *Mahia* is operated by 3 compressors. Two are driven by electrical motors, the third being directly driven by a steam turbine. Although the refrigerating plant is operated normally by thermostatic refrigerant control, arrangements are provided so that the thermostatic controls may be bypassed and the plant operated by manual controls. Plate freezers with a capacity for 12 tons of shrimp per 24 hours are mounted on the main deck.

Automatic shrimp-processing machinery manufactured by a New Orleans, La., firm installed in the vessel consists of the following: 1 automatic shrimp peeler; 1 automatic shrimp-cleaning machine; 1 automatic shrimp-waste separator; 1 capacity-automatic shrimp deveiner; and 1 fast precision high-capacity grader for raw peeled shrimp.

The vessel's 2 cargo holds are both kept at a temperature of -20° C. (-4° F.) and have a total capacity of 28,510 cubic feet. Another 2 storerooms have a total capacity of 1,446 cubic feet, and a refrigerated storeroom aft has a capacity of 300 cubic feet.

The *Mahia* will be operating with a fleet of shrimp trawlers and after taking on board the trawlers' shrimp catches, a feed tank is used to cool the shrimp to a temperature of approximately 32° F. From the feed tank the shrimp are conveyed into the automatic shrimp peeler which is located atop the new deckhouse, and then through the cleaning machine also located on the new deckhouse. From there, they move down through the shrimp-waste separator to the automatic deveiner on the upper deck. From those machines the shrimp pass through the high-capacity grader on the tweendeck. After being packed by factory workers on the vessel the shrimp will be frozen in the freezing machines, packed in cartons, and loaded into the cold-storage holds.

In order to accommodate the extra staff required for the factoryship workers, two new cabins have been built 'tweendecks' aft of the factory working space, and a new deckhouse has been added between the midship and aft areas of the vessel. (Submitted by P. Brady, Fleetwood, Lancashire, England.)



Peru

ANCHOVY VESSELS AND CATCH, 1961:

A large part of Peru's great anchoveta catch is taken in small wooden vessels. The vessels known as "anchoveteras" average 65 feet in length and have a capacity of about 120 metric tons. The average "anchovetera" re-



Fig. 1 - Peruvian "anchovetera" with hold and decks full of fish unloading at Chimbote.

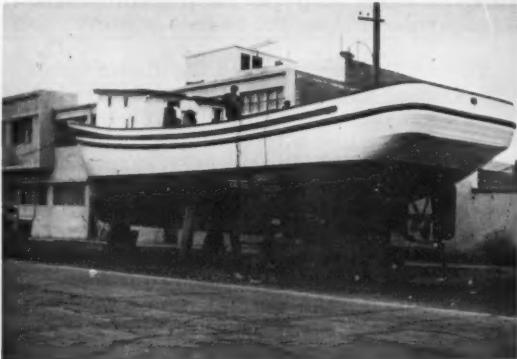


Fig. 2 - A typical Peruvian "anchovetera."



Fig. 3 - Conveyor belt carrying anchovies into fish meal plant for processing.

Peru (Contd.):

quires a 200-horsepower motor. The vessels are also called "bolicheras" because they use a purse-seine net known as the "boliche." The vessels usually make one-day trips and fish during daylight hours. Some fish meal plants use suction hoses to unload fish from the vessels.

In 1961, Peru's anchoveta catch amounted to 5 million metric tons or about 96 percent of the total Peruvian fish catch. The increase in Peruvian fish meal production indicates that Peru's anchoveta catch was even larger in 1962. Anchoveta is the raw material for Peru's fish meal industry. (United States Embassy, Lima, January 23, 1963.)



Philippine Republic

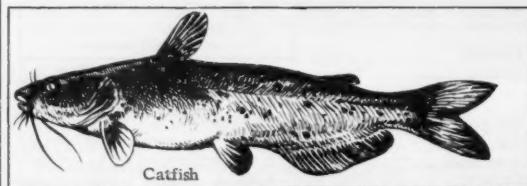
FISHERIES OF BIGGEST LAKE BEING STUDIED:

Laguna de Bay is the biggest lake in the Philippine Islands. It is about 355 square miles and is well known locally for its fishery resources, as well as ducks. Laguna de Bay has been fished for generations, but the extent of its potential and that of other lakes in the Philippines is relatively unknown. The shores of the lake are thick with water hyacinth, a pest plant which spreads like a miniature jungle and also grows in clumps in the bays. One of the problems faced by the local fishermen and scientists in assessing the fishery resources of the lake is control of the water hyacinth if fishing in Laguna de Bay is to continue.

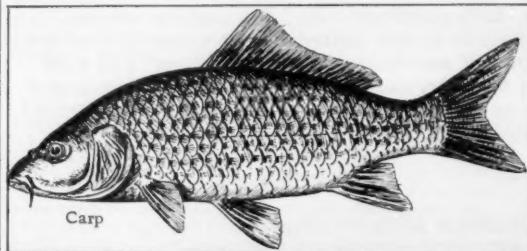
The rapidly growing population of the Philippine Islands is now estimated at 30 million compared with about 20 million ten years ago. The result is a constantly increasing demand for more food, especially protein-rich food such as fish. The Government is planning substantial increases in the national food supply, particularly in rice and fish, and has introduced scientific methods to the local fishery. Laboratories, store-rooms, lecture rooms, and other facilities have been built at Los Banos near Laguna de Bay to house the staff of the Freshwater Fisheries Investigation Unit which has been formed by the Philippine Bureau of Fisheries. The Unit consists of two sections, one for biology and the other for aquatic resources.

Assistance in setting up the Philippine Freshwater Fisheries Investigation Unit was given by the Food and Agriculture Organization (FAO) which sent a fresh-water fisheries biologist to assist the local staff. Another FAO fisheries expert was scheduled to go to Los Banos early in 1963 to continue the work of assisting the local Philippine scientists in their investigations. Most of the scientific equipment used was provided by Great Britain under the Colombo Plan, and fishing gear and other equipment used in the scientific studies were donated by FAO.

According to a member of the Unit's scientific staff, their objective is to determine the fish population of Laguna de Bay to see how much fishing can be carried on to obtain maximum yield without impairing the fish stocks. The investigation being conducted by the Unit is extensive. It covers chemistry, hydrography, plankton studies, the life history of the lake fish and shrimp, fish taxonomy, and fish populations. The lake has been divided into four areas to carry out such investigations and research. The lake has a wide variety of fish including catfish, carp, mullet,



goby, perch, and other species. Fresh-water shrimp in commercial quantities is also caught in the lake.



One of the scientists on the Freshwater Fisheries Investigation Unit staff spent a year in Great Britain on a Colombo Plan scholarship. At the Los Banos Laboratory, he is studying non-biting midges (small winged insects which breed in water). Fish feed on the larvae of the insects. The scientists hoped to cultivate the insect larvae in

Philippine Republic (Contd.):

ponds, to use with algae as a food for fry and fingerlings raised in fish farming. (Food and Agriculture Organization, Rome, January 20, 1963.)



Portugal

CANNED FISH EXPORTS,
JANUARY-SEPTEMBER 1962:

Portugal's total exports of canned fish during the first nine months of 1962 were about unchanged from the same period of 1961. Sardines accounted for 78.7 percent of the 1962 exports of canned fish, followed by anchovy fillets with 8.5 percent.

Portugal's principal canned fish buyers in the first nine months of 1962 were Germany with 9,999 metric tons, followed by the United Kingdom with 7,799 tons, the United States with 5,870 tons, Italy with 5,714 tons, and France with 3,729 tons.

Portuguese Canned Fish Exports, January-September 1961-1962						
Product	January-September				1961	
	1962	Metric Tons	1,000 Cases	1962	Metric Tons	1,000 Cases
In Oil or Sauce:						
Sardines	39,305	2,067	40,281	2,120		
Chinchards	1,626	85	1,733	91		
Mackerel	1,722	69	1,060	42		
Tuna and tuna-like	2,833	94	2,689	96		
Anchovy fillets	4,253	425	3,770	377		
Others	214	11	186	10		
Total	49,953	2,751	49,719	2,736		

In September 1962, Portugal's canned fish exports to the United States consisted of 378 tons of sardines, 157 tons of tuna, 218 tons of anchovy fillets, 8 tons of mackerel, and 9 tons of other species. (Conservas de Peixe, November 1962.)

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CANNED FISH PACK,
JANUARY-SEPTEMBER 1962:

Portugal's total pack of canned fish in oil or sauce for the first nine months of 1962 was 15.1 percent greater than in the same period of 1961. The sardine pack accounted for 63.4 percent of the total pack, followed by mackerel with 12.0 percent, tuna 10 percent, and anchovy fillets 8.1 percent of the January-September 1962 total. The canned

sardine pack for the first nine months of 1962 was up about 4.1 percent as compared with the same period in 1961. Packs of all other canned fish products also increased in January-September 1962 as compared with the same period of 1961.

Portuguese Canned Fish Pack, January-September 1961-1962						
Product	January-September					
	1962		1961			
In Oil or Sauce:			Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
Sardines	30,781	1,620	29,651	1,561		
Chinchards	2,724	143	1,987	104		
Mackerel	5,838	233	2,766	110		
Tuna and tuna-like	4,856	162	3,957	140		
Anchovy fillets	3,938	394	3,638	364		
Others	433	23	211	11		
Total	48,570	2,575	42,210	2,290		

During January-September 1962 sardine landings amounted to 69,385 metric tons, up fractionally from sardine landings of 69,164 tons in the same period of 1961. (Conservas de Peixe, November 1962.)

* * * * *

MORE BONDS ISSUED TO
AID FISHING INDUSTRY:

The sixth series of bonds, issued for the benefit of the fishing industry, has been authorized by the Portuguese Ministry of Finance and Navy. The bonds, amounting to 24 million escudos (about US\$840,000), will be used under the Second Six Year Development Plan for the construction and modernization of trawlers, the completion and equipping of the new fishermen's wharf near Lisbon, and the construction and conversion of cod fishing vessels.

Although fish is a major item in the Portuguese diet, the fishing fleet is below modern standards. The cod fishing fleet, that operates in the western Atlantic for about seven months each year has failed to supply the need for salt cod. In 1961, Portugal imported close to US\$8 million worth of salt cod from other countries. (United States Embassy, Lisbon, December 21, 1962.)



Spain

NEW FISHERY FIRM PLANS
LARGE-SCALE EXPANSION:

The six freezer-trawlers of a new Spanish fishery firm landed 4,500 metric tons of fro-

Spain (Contd.):

zen hake in 1962. The trawlers fished off the coast of South Africa and South America (mainly off the coast of Argentina). The firm plans to expand its fishing fleet, begin producing fish meal, and raise its production of frozen fish and fish meal to 14,000 tons in 1963 and 25,000 tons in 1964.

Two more vessels will be completed for the new firm by June 1963. The firm plans a fleet of 21 vessels, including two refrigerated transport vessels and a factoryship. The latter is being converted from the former transatlantic liner *Havana*. It will be renamed *Pescanova I* and operate as a refrigerated transport vessel, as well as a factory for processing fish and producing fish meal. It has a registered tonnage of 16,213 and a cargo capacity of about 7,000 tons. *Pescanova I* will be Spain's first factoryship.

The new firm is also exploring new fishing grounds. This is apparently the first mission of each new vessel added to its fleet. The firm is the only Spanish firm known to be operating outside the traditional fishing grounds worked by the Spanish fishing fleet. For the time being, the firm is only interested in hake, but other species are being considered for future exploitation. Working under an ambitious plan, the firm has not hesitated to attempt the introduction of frozen fish in the Spanish market. While this innovation had only lukewarm reception at first, it is gaining greater acceptance among the consuming public in inland areas, where the supply of fresh iced fish is uncertain. (United States Consulate, Vigo, January 18, 1963.)

Note: See Commercial Fisheries Review, June 1962, 1. 61.



Thailand

INDUSTRIAL PROMOTION ACT OF 1962 INCLUDES BENEFITS FOR THE FISHING INDUSTRY:

The Promotion of Industrial Investment Act of Thailand, a revision of previous laws relating to the promotion of industrial investment, including private foreign investment, went into force on February 10, 1962. The new law substantially increased the privileges and benefits awarded to promoted industries. The law provides that promotion certificates may be granted to individuals and

firms that plan to establish or expand certain types of industries in Thailand. The promotion certificates carry specific guarantees, rights, and benefits including tax reduction. The following parts of the fishing industry are eligible for promotion under the new law: fish processing, deep-sea fishing, and pearl oyster breeding. To qualify under the law, a fish processing operation must have a minimum daily capacity of five metric tons. Deep-sea fishing projects are required to include a shore plant with the capacity to process the catch of a vessel of at least 30 gross tons operating in waters of a depth of at least 30 meters (98 feet). Deep-sea fishing applications must cover both shore and offshore operations as a package project. The minimum investment required of a pearl oyster breeding project is \$100,000.

Note: Detailed information about the new law is given in Industrial Promotion Act of Thailand, 1962, WTIS Part 1, Economic Report No. 62-81. Price 15 cents. That report is supplemented by Investment Factors in Thailand, 1962, WTIS Part 1, Economic Report No. 62-82. The reports were issued by the Bureau of International Programs, U. S. Department of Commerce, Washington, D. C., and are sold by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., and by U. S. Department of Commerce field offices.



U.S.S.R.

FISHING FLEET OPERATIONS IN WATERS OFF U. S. COAST, 1962:

Highlights of the Soviet fishing effort off the United States coast in 1962 by areas:

North Pacific and Bering Sea: In this area, a peak of about 200 Soviet fishing vessels was sighted in mid-June 1962, mostly in the Bering Sea. Segments of the fleet began to move into the eastern North Pacific and the Gulf of Alaska in June; over 100 sightings of Soviet vessels were reported in the Gulf of Alaska in late November. In mid-November, 18 Soviet fishing craft were 30 miles south of Cordova, Alaska.

The North Pacific Soviet catch was reported to have included king crab, herring, ocean perch, cod, sablefish, Alaska pollock, and flounder. The quantity of each species taken is not known. No reports have been received of Pacific halibut being taken.

In 1961, over 100,000 metric tons of fish and shellfish were taken by the Soviets in the eastern Bering Sea; the 1962 catch is expected to total several times that of 1961. Soviet plans call for a maximum sustained annual catch of 500,000 metric tons from the eastern Bering Sea. No catch goals have been announced for the Gulf of Alaska. (Unpublished and other Soviet sources.)

Other Areas in the Pacific: In the early summer of 1962, two Soviet exploratory fishing vessels were reported off the coasts of Oregon and Washington; species taken unknown.

Northwest Atlantic (Georges Bank): A peak of about 160 Soviet fishing vessels was sighted on Georges Bank in August 1962. Herring was taken in quantity. Bottomfish such as ocean perch, cod, haddock, flounder, and Atlantic halibut probably were taken in lesser quantities. A Soviet exploratory vessel was reported to have taken menhaden.

U.S.S.R. (Contd.):

In 1961, the Soviet catch in the Northwest Atlantic (including the Grand Banks and Georges Bank) was about 350,000 metric tons of fish, of which about 158,000 tons were cod, 68,000 tons were herring, 60,000 tons were ocean perch, 40,000 tons were haddock, and the remainder a variety of other species. The 1962 catch is reported to have been at least as large if not larger. (Various published and unpublished sources.)

North and South Carolina and Florida Coasts: In late 1962, several Soviet vessels were reported engaging in exploratory fishing off the Carolina coasts and Florida. The species taken are not yet known, but commercial quantities of menhaden, shrimp, and possibly tuna were probably being sought.

Caribbean and Gulf of Mexico: Five Soviet trawlers are believed to be operating in the Caribbean and Gulf of Mexico out of Cuba. In late 1962, three of the vessels docked in Veracruz, Mexico, for supplies. In August 1962, announcement was made of a Soviet-Cuban fishing base to be built in Havana, Cuba. The base is expected to aid Soviet fishing operations throughout the Western Atlantic.

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NEW CRAB FACTORYSHIP:

Late in December 1962, the newest Soviet crab cannery ship, the Aleksander Obukhov, left Leningrad for its home port of Vladivostok. This vessel is reported to be outfitted with equipment superior to that used on cannery ships currently operating in the North Pacific and Bering Sea. The cannery line has a daily capacity of 200,000 cans of fishery products. (Unpublished sources.)

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SOVIET FISHERY RESEARCH EMPHASIZES THE DEVELOPMENT OF FISHING IN THE PACIFIC OCEAN:

Soviet fishery research has been placed under the control of a new State Committee within the U.S.S.R. Council of Ministers. Some of the plans and goals of Soviet fishery research were described in a statement by the Assistant Director of the U.S.S.R. All-Union Scientific Research Institute of Marine Fisheries and Oceanography (VNIRO), which appeared in the Soviet newspaper, Krasnaia Znamia, September 20, 1962. Following is a translation of the statement:

"All the scientific research necessary for the development of the Soviet fishing industry will be conducted more regularly and purposefully now that the scientific establishments of the fishing industry have been transferred to the State Committee. The task of increasing the total catch to 50 million metric centners (about 11 billion pounds) by 1965 has been set by the Communist Party and the

Government. This can be achieved mainly by developing ocean fishing.

"Science is faced with big tasks connected with the study of new fishing areas and new species of fish in the world ocean. The most perfect technique and latest discoveries in radio-electronics, automatics, and computing equipment must be used in research for the maximum mechanization of fishing operations and fish processing.

"The Pacific is one of the world's richest fishing areas. In the northern part of that ocean, catches have greatly increased in the last few years. The (Soviet) fishing industry of the Far East has, therefore, a particularly big chance to obtain larger catches of fish and other marine produce.

"We propose to organize several important research expeditions in the near future. One of them will be devoted to the study of invertebrates and algae. . . . In many countries, including those of Western Europe, invertebrates are more valued than fish. . . . In the U.S.S.R. that branch of fishing is poorly developed as yet and must be advanced.

"The study of sea depths over 400-500 meters (1,312-1,640 feet) is another major task in fishing research. Modern trawl fishing reaches depths of 250-300 meters (820-984 feet). But we know that greater depths--300-1,000 meters (984-3,280 feet)--are very promising. Explorations conducted by the U.S.S.R. and other countries show that great quantities of valuable fish inhabit those depths--for example, some species of ocean perch and turbot. . . . This research will provide additional fishing facilities in old fishing areas.

"A practical step has already been taken in this direction. In the Bering Sea, good catches have been made at a depth of 400-700 meters (1,312-2,296 feet) by a combined expedition of the U.S.S.R. Pacific Research Institute of Marine Fisheries and Oceanography (TINRO) and VNIRO. Trawling tests yielded a regular catch of up to 2.5 metric tons of fish per hour.

"Special attention will be paid to research on ocean fishing, especially for saury, tuna, and some other species. Besides yielding high-quality raw material, ocean fishing is important because of its regularity--differences in the catch are very small in different years.

U.S.S.R. (Contd.):

"Before the end of 1962 we propose making arrangements for a big expedition which will study the schools of whales in the North Pacific and their migration routes from the wintering areas to summer pastures. The area of operations for new (Soviet) whaling fleets arriving in Vladivostok will then be more clearly defined.

"The organization of the State-Committee for the fishing industry involves various measures meant to improve the material and technical facilities of scientific establishments, including those engaged in Pacific ocean research. . . . Several research ships of large displacement are under construction. Some of them will be placed at the disposal of TINRO."

Note: See *Commercial Fisheries Review*, July 1962 p. 102, April 1962 p. 64.



United Kingdom

FISHERMEN FROM SOUTHWEST ENGLAND SEEK 12-MILE FISHERIES LIMIT:

Soviet fishing pressure has led English fishermen operating off the coast of Devon in southwest England to seek a 12-mile fisheries limit. In December 1962, a fleet of 70 Soviet trawlers was reported to have caused over £5,000 (US\$14,000) damage to nets and gear used by English fishermen from Devon. The Soviet vessels were said to have destroyed hundreds of English lobster pots and crab lines while fishing just outside the three-mile limit. (*Fish Trades Gazette*, December 22, 1962.)



Venezuela

EXPORTS OF EDIBLE FISHERY PRODUCTS, 1961:

Shipments to the United States accounted for 76.1 percent of the quantity and 81.1 percent of the value of Venezuela's total exports of edible fishery products in 1961. Shrimp was the leading fishery product exported to the United States by Venezuela in 1961.

Commodity and Destination	Quantity	Value	
		Metric Tons	Bolivares 1,000
Shrimp:			
United States ^{1/}	1,400.0	3,297.7	984.4
Aruba and Curacao Islands . . .	5.3	14.5	4.3
Total shrimp	1,405.3	3,312.2	988.7
Fresh and Frozen Fish:			
United States	0.6	1.1	0.3
Aruba and Curacao Islands . . .	311.5	407.1	121.5
Total fresh & frozen fish . . .	312.1	408.2	121.8
Dried, Cured, and Salted Fish:			
United States	1.5	3.0	0.9
Curacao Island	4.0	7.0	2.1
Total dried, cured, and salted fish	5.5	10.0	3.0
Canned Fish:			
United States	851.5	1,377.8	411.3
West Germany	81.8	142.6	42.6
Colombia	48.8	84.2	25.1
Curacao Island	18.4	28.7	8.5
Italy	9.3	11.6	3.4
Puerto Rico	138.0	276.6	82.6
Other	1.8	2.9	0.9
Total canned fish	1,149.6	1,924.4	574.4
Unclassified Edible Fishery Products:			
United States	7.1	10.5	3.1
Aruba and Curacao Islands . . .	88.8	113.9	34.0
Italy	1.0	0.8	0.2
Total Unclassified	96.9	125.2	37.3
Grand Total	2,969.4	5,780.0	1,725.2

^{1/}Probably mostly frozen.

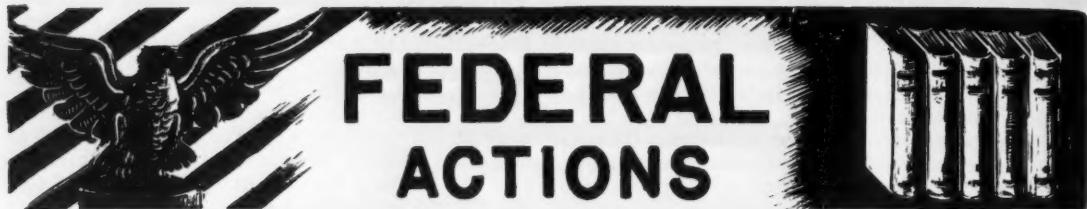
Note: Venezuela bolivares 3.35 equals US\$1.00.

Source: *Boletin de Comercio Exterior*, December 1961.



CORRECTION

In a map on page 83, February 1963 issue, there was an error in geographic location. "Iceland" should have been the identification instead of "Spitsbergen."



FEDERAL ACTIONS

Department of Agriculture

FARMERS HOME ADMINISTRATION

FISH FARMERS AND OYSTER PLANTERS NOW ELIGIBLE FOR CERTAIN LOANS:

Federal Agricultural Credit Regulations have been revised to include operating and emergency loans for fish farmers and emergency loans for oyster planters.

Revisions to Title 6--Agricultural Credit--Code of Federal Regulations were published by the Farmers Home Administration (FHA) in the Federal Register, January 1, 1963. The new regulations affecting fish farmers and oyster planters appear in Parts 331 and 332. The new regulations (signed December 19, 1962) are part of extensive revisions to Sub-chapter C--Loans Primarily for Production Purposes--Chapter III, Title 6, CFR.

The revised regulations affecting fish farmers are the result of the Food and Agriculture Act of 1962 (P.L. 87-703). The Act in Section 343 provides, "As used in this title (1) the term 'farmers' shall be deemed to include persons who are engaged in or who, with assistance afforded under this title, intend to engage in fish farming, and (2) the term 'farming' shall be deemed to include fish farming." Those affecting oyster planters are the result of P.L. 87-832 which extends to them the same benefits for production disaster loans as provided for farmers and stockmen.



Civil Aeronautics Board

NEED FOR UNIFORM BILL OF LADING FOR AIR CARGO SHIPMENTS STUDIED:

Shippers are invited to submit their views to the Civil Aeronautics Board (C. A. B.) on the need for a uniform bill of lading



for air cargo shipments. The C. A. B. is considering proposing legislation which would require the air carriers to issue such a document. At present, the air carriers are free to set their own terms for handling freight.



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

GRANT APPROVED TO ESTABLISH MARINE RESEARCH CENTER IN OREGON:

A marine sciences research center at Yaquina Bay near Newport, Oreg., will be established as a result of a \$959,590 public facilities grant from the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce. The grant will enable the Oregon State Board of Education, Corvallis, Oreg., to build a marine research center which will include a causeway and dock facilities for vessels. The Board of Education will lease the facilities to the Oregon State University which will staff and operate the center.

In addition to the Federal funds, the University will furnish \$245,000 to equip the research center for a total project cost of \$1,204,590. The University will also provide about \$650,000 annually for operating expenses from research grants and State funds.

The new research center will provide important and varied economic benefits. A total of 110 new jobs, including professional and technical positions at the center, will be created as a direct result of the work involved in the project. It is also estimated that 210 indirect jobs will be created in allied trades and services directly associated with the center. The training of scientists, engineers, and industrial personnel at the center will aid the development of marine-oriented industries in the West Coast States. In addition, the center's marine life displays are expected to attract many tourists. A similar research center--the Scripps Institute of Oceanography at La Jolla, Calif. -- attracts 250,000 visitors each year.

The Community Facilities Administration of the U. S. Housing and Home Finance Agency investigated the project and made recommendations which led to ARA's approval. The U. S. Bureau of Commercial Fisheries, the Coast and Geodetic Survey, and the Department of the Navy, all reviewed the project and made favorable recommendations.

Yaquina Bay is located in Lincoln County, Oreg., which was designated as eligible to participate in the Area Redevelopment program because of long-term and heavy unemployment. Lincoln County was also declared eligible because of its previous participation in the Rural Areas Development program of the U. S. Department of Agriculture.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

STUDY OF STATE AND LOCAL FOOD LAWS:

A study of state and local food and drug laws and their administration as recommended by the Commissioner of Food and Drugs, was approved on January 18, 1963, by the Secretary of Health, Education, and Welfare. The study was first suggested by the Association of Food and Drug Officials of the United States. It is made possible by a sum of \$300,000 included in the Department's current appropriation for that purpose.

The study was strongly supported by the Citizens Advisory Committee on the Food and Drug Administration, which submitted its report last October. It will be made by a qualified nonprofit organization, such as a foundation or university under a contract with the Department.

"This survey will cover State and local activities with respect to foods, drugs, therapeutic devices, cosmetics, and hazardous substances used in the home," the Secretary said. "It should bring to light any needed improvement in laws, organization, and support for Federal-State coordination. The organization conducting the study will be requested to include in its report specific proposals for bringing about the improvements they recommend."

Note: See Commercial Fisheries Review, December 1962 p. 87.



Department of the Interior

SUPPORTS PROPOSAL TO OPEN EASTERN BERING SEA HALIBUT FISHERY TO JAPANESE FISHERMEN:

The Secretary of the Interior has strongly reaffirmed his belief in the principle of abstention by supporting recent action of the American Section of the International North Pacific Fisheries Commission which would open the eastern Bering Sea to halibut fishing by Japan.

In a letter to Alaska's Governor, the Secretary said the American Section's action merited support because it will protect the vital interests of United States fishermen and

will preserve the integrity of the basic principle of "abstention"--a treaty arrangement under which member countries agree to refrain from catching certain fish in specified areas. (The text of the Secretary's letter is reproduced on p. 88.)

The Secretary's letter pointed out that under the American Section's recommendation only the eastern Bering Sea would be opened to Japanese halibut fishing. Only about 10 percent of the halibut fishery is located in that area. The remaining 90 percent of the fishery, located in the eastern North Pacific Ocean, remains completely protected for United States and Canadian fishermen under the abstention principle.

Under the 1952 North Pacific Treaty, the Secretary explained, Japan agreed temporarily to refrain from fishing for halibut in the Bering Sea. If scientific evidence later showed that the United States and Canada were taking all the halibut the resource could sustain, Japan would continue to abstain from fishing for halibut in Bering Sea waters.

The Secretary in his letter stated that the International Commission simply did not have the necessary scientific evidence to support the conclusion that the halibut fishery in the Bering Sea is now being fully utilized.

If the United States and Canadian Commissioners were to insist upon Japanese abstention from halibut fishing in the Bering Sea--based upon inadequate scientific evidence--the very principle of abstention might be placed in jeopardy, the Secretary said. If that happened it could have grave effects on the United States fishing industry in the future, he added.

"It is our objective to see that the (treaty) situation continues to be favorable to the American fishermen, and we see continuation of the Convention as a means to that end," the Secretary said.

The Secretary noted that at the Commission's February meeting in Tokyo, that the conservation measures for the eastern Bering Sea were to be thoroughly reviewed. "I am hopeful that the resultant agreement will still allow a continued expansion of the United States fishery in this area," the Secretary said.

The halibut catch by United States and Canadian fishermen in the Bering Sea has

increased from some 267,000 pounds in 1956 to more than 7 million pounds in 1962. There is evidence that new concentrations of halibut have been found recently as the fleet has expanded, the Secretary said.

He also noted that the Commissioners were assisted in their discussions on this matter by high-level industry and government representatives in their deliberations on the halibut question.

Dear Governor Egan:

President Kennedy has requested that I supply a further answer to your letter of December 21 in which you support your criticism of recent action on the International North Pacific Fisheries Commission with detailed quotations and facts. I have looked into this matter in some detail. I find the problem both complicated and serious.

It is true that, if the President approves the recommendation which the International North Pacific Fisheries Commission made at its 1962 annual meeting, the Japanese may develop a halibut fishery in competition with our own fishery in the eastern Bering Sea. We have no idea yet of the kind or size of this fishery.

As you know, there will be a meeting of the Commission in Tokyo this coming February, and at that time the conservation measures for the eastern Bering Sea halibut will be thoroughly reviewed. The primary purpose of this meeting will be to develop a conservation program which will assure the maximum productivity of the halibut resources of the eastern Bering Sea in view of the expected entry of the Japanese into this fishery. At the same time I am hopeful that the resultant agreement will still allow a continued expansion of the United States fishery in this area.

On reviewing the action of the North Pacific Commission, I do not find that this decision was arrived at in either a hasty or a haphazard fashion. It is perfectly obvious from the record that the U.S. and Canadian Governments have requested the Halibut Commission over the past 6 or 7 years to prepare for presentation to the International North Pacific Fisheries Commission scientific evidence regarding the extent of the utilization of the halibut stocks of the eastern Bering Sea. It is also evident that there has been close cooperation between scientists of the Halibut Commission and scientists of the Governments of Canada and the United States.

Recently the Halibut Commission prepared a draft report of their investigations in the Bering Sea. This document, which has been studied thoroughly by the scientists of both Governments, has clearly shown the gaps in our knowledge of the eastern Bering Sea halibut resources. This in no way should be taken as critical of the Halibut Commission. With limited funds, they have extended their investigations into the Bering Sea in about the same proportion to the extent of our fishery in that area. This report makes the statement quoted in your letter to the effect that tagging experiments in the Bering Sea have demonstrated a high degree of utilization of halibut found in the area where the U.S. and Canadian fleets concentrate and, further, that some of the Commission's first or preliminary quantitative estimates of fishing mortality give rates higher than those found in other sections of the coast. The report further states: "... although this does not prove that these grounds are being fully utilized, it leaves little doubt that the level of utilization is high. Furthermore, no evidence is even available to suggest that a greater yield could be taken from the region year after year." Unfortunately, these conclusions apply only to the halibut concentrations where fishing up to now has been concentrated. New concentrations have been found recently as the fleet has expanded its area of fishing.

Evidence that the catch in the Bering Sea by the Canadian and United States fishery is increasing is contained in the following table which gives the total Canadian and United States catches in the Bering Sea from 1956 to 1962.

Halibut Catches of the U.S. and Canadian Fisheries Fishing in Bering Sea 1956 through 1962

1956	267,000 lbs.
1957	47,000
1958	2,180,000
1959	4,113,000
1960	2,688,000
1961	1,349,000
1962	7,289,000

It is obvious to me that the Bering Sea halibut stocks have only recently been extensively fished by Canadian and United States fishermen, and the fishery is still expanding. The catch in 1962 was the greatest on record and over 25 times that of 1956.

You have indicated in your letter that because of the statements of the Halibut Commission to the effect that utilization of the concentrations of halibut now being fished is high, and that there seems to be a relationship between the stocks in the Bering Sea and those south and east of the Alaska Peninsula, the action of the International North Pacific Fisheries Commission was beyond understanding. I would refer you to the International North Pacific Fisheries Convention itself.

Article III of this Convention requires that after 5 years the Commission study annually whether or not stocks under abstention continue to qualify under the provisions of Article IV of the Convention. Article III goes on to state that if the Commission determines that a stock does not reasonably meet the provisions of Article IV, then the Commission shall recommend that it be removed from the Annex. Article IV of the Convention requires that for any stock of fish to qualify for abstention, the Commission must find that: "(1) evidence based upon scientific research indicates that more intensive exploitation of the stock will not provide a substantial increase in yield which can be sustained year after year." As I interpret this section of the Convention, there is no latitude left to the Commission if the United States and Canada cannot show that more intensive fishing will not substantially increase the sustainable yield. The record of the fishery during the past several years has clearly demonstrated that the yield has increased with increased fishing.

There are two other criteria, but in the present instance the United States and Canada, with the help of the Halibut Commission and in spite of its long and serious study of the problem, are unable to provide evidence that more intensive exploitation of the stock will not provide a substantial increase which can be sustained year after year. Thus, if we were to live up to our commitments under the Convention, the only course left, in the face of the record, was to recognize that this proof was not available for Bering Sea halibut and, therefore, that these halibut no longer qualify for abstention. It seems to me that the protection given the North Pacific salmon and halibut fisheries under the present Convention is adequate evidence that this Convention has operated in such a manner as to provide for the conservation of these resources and for the preservation of our own valuable fisheries.

With respect to the Commission's action concerning herring off the west coast of Queen Charlotte Island of British Columbia, the Canadian Section of the Commission again was called upon to prove that these stocks were being fully utilized. Since at the present time, for all practical purposes, there is no Canadian fishery on these particular stocks, it could not be proved. Therefore, again the only action possible that could be taken under the present Convention was to recommend to the signatory governments that these stocks be removed from the abstention list.

It had not occurred to me that the Commission was, in fact, benevolent. On the contrary, it seemed only to be doing what was required. At the same time it must be remembered that, for all practical purposes, the Convention has resulted in almost complete protection of halibut and salmon of the eastern North Pacific Ocean. There remains, of course, the special problem of the sockeye salmon of the Bering Sea. Thus, it appears to me that the results brought about by the present Convention have been very advantageous to American fishermen. It is our objective to see that the situation continues to be favorable to the American fishermen, and we see continuation of the Convention as a means to that end. If the United States is to have it continue, we must abide by its terms. If both you and I do not like some of the terms of the Convention then we should seek to have these altered in various ways more suitable to us. I do not believe, however, that we can criticize the Commission for carrying out the clear mandate which the Convention places on it.

One must remember that this Convention is a very stringent one with respect to the nations involved. On one hand, Japan is prevented from fishing freely on the high seas by virtue of the fact that Japan is obligated to observe abstention with respect to salmon and halibut in the eastern North Pacific Ocean. The Convention limits this severe restriction on the Japanese by imposing demanding scientific criteria on the nations requesting abstention. These limitations are intended to prevent arbitrary and capricious actions which affect the right of nations to fish on the high seas beyond the territorial limits of coastal countries.

After reviewing thoroughly the results of the 1962 meeting and the courses of action open to the Commission under the terms of this treaty, I find nothing irresponsible or haphazard about the action of the Commission. It seems to me that if the United States does not carry out its obligations under the terms of the treaty, the future of our North Pacific fisheries is in jeopardy. As a minimum loss we will share these resources which traditionally have been fished exclusively by Canadian and U.S. fishermen. The resources might well be overfished and depleted by the unregulated fishing of several nations, leaving the halibut stocks in the same pitiable condition they were in before the present Halibut Convention.

I choose to align myself on the side of honoring our international commitment, and protecting the sound principle of abstention. This principle provides for the conservation of the fishery resources of the North Pacific Ocean and allows our fishermen to continue to harvest a major share of these resources on the basis that they have conserved them at great cost and sacrifice and have maintained them at a very high level of productivity for over the past 50 years.

If the U.S. Government fails to accept the recommendations of the Commission, we may very quickly find ourselves with no protection whatsoever for the valuable resources now almost fully reserved for the use of the fishermen of the United States and Canada.

Sincerely yours,

(Sgd) Stewart L. Udall
Secretary of the Interior

Honorable William A. Egan
Governor of Alaska
Juneau, Alaska

Note: See Commercial Fisheries Review, January 1963 p. 64.

FISH AND WILDLIFE SERVICE

ASSISTANT FOR PUBLIC AFFAIRS TO COMMISSIONER'S OFFICE NAMED:



Dwight F. Rettie.

Dwight F. Rettie, of Arlington, Va., has been named Assistant for Public Affairs in the Office of the Commissioner of the Fish and Wildlife Service, the Department of the Interior announced on December 11, 1962.

Rettie, 32, a career service officer, has been public information officer for the Department's

Bureau of Land Management since 1957.

In his new post Rettie will be in charge of the information and education activities for the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. Working on the staff of Fish and Wildlife Service Commissioner Clarence F. Pautzke, Rettie, will direct public information and educational programs covering such diverse functions as oceanography, wetlands preservation, and the growing needs for public services at the Nation's wildlife refuges which last year were host to more than six million people.

* * * * *

BUREAU OF COMMERCIAL FISHERIES

NEW FEES FOR FISHERY PRODUCTS INSPECTION SERVICES:

New fees and charges for fishery products inspection services of the U. S. Department of



Inspection service.

the Interior went into effect on February 1, 1963. The basic change is the increase in the regular hourly rates for continuous inspection from \$4.20 to \$4.45 and for lot inspection from \$6.00 to \$6.50. Other changes include adjustments in fees for score sheets and fees for additional copies of inspection certificates. The cost of maintaining the inspection service for processed fishery products and other products has increased materially since the adjustment of fees which became effective June 1, 1962.

Title 50 of the Code of Federal Regulations is changed by amendments to the regulations governing Part 260--Inspection and Certification of Subchapter G--Processed Fishery Products, Processed Products Thereof, and Certain Other Processed Food Products, relating to fees and charges (50 CFR 260.70 to 260.79). The amended regulations, dated January 14, 1963, appeared in the Federal Register, January 19, 1963, as follows:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fishes, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER G—PROCESSED FISHERY PRO- DUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 260—INSPECTION AND CERTIFICATION

Fees and Charges

The regulations governing Part 260—Inspection and Certification, of Subchapter G—Processed Fishery Products, Processed Products Thereof, and Certain Other Processed Food Products, relating to fees and charges (50 CFR 260.70 to 260.79) are hereby amended pursuant to the authority contained in section 6(a) of the Fish and Wildlife Act of 1956 (16 U.S.C. 742e(a)), as amended. The amendment as hereinafter set forth revises the schedule of fees and charges for inspection services.

The cost of maintaining the inspection service for processed fishery products and other products has increased materially since the adjustment of fees which became effective June 1, 1962. The basic change is the increase in the

hourly rates for continuous inspection from \$4.20 to \$4.45 and for lot inspection from \$6.00 to \$6.50.

Other changes include adjustments in fees for score sheets and fees for additional copies of inspection certificates. The amendment is as follows:

1. Section 260.70 is hereby revised to read as follows:

§ 260.70 Schedule of fees.

(a) Unless otherwise provided in a written agreement between the applicant and the Secretary, the fees to be charged and collected for any inspection service performed under the regulations in this part at the request of the United States, or any agency or instrumentality thereof, shall be in accordance with the applicable provisions of §§ 260.70 to 260.79.

(b) Unless otherwise provided in the regulations in this part, the fees to be charged and collected for any inspection service performed under the regulations in this part shall be based on the applicable rates specified in this section for the type of service performed.

(1) *Continuous inspection.*

	<i>Per hour</i>
Regular time.....	\$4.45
Overtime.....	5.25

Applicants shall be charged at an hourly rate of \$4.45 per hour for regular time and \$5.25 per hour for overtime in excess of 40 hours per week for services performed by inspectors assigned to plants operating under continuous inspection. Applicants shall be billed monthly at a minimum charge of 8 hours per working day plus overtime, when appropriate, for each inspector. A minimum yearly charge of 260 days will be made for each inspector permanently assigned to each plant.

(2) *Lot inspection—officially and unofficially drawn samples.*

For lot inspection services performed between the hours of 7:00 a.m. and 5 p.m. of any regular workday—\$6.50 per hour.

For lot inspection services performed between the hours of 5 p.m. and 7 a.m. of any regular workday—\$10.00 per hour.

For lot inspection services performed on Saturday, Sunday, and National legal holidays—\$10.00 per hour.

The minimum fee to be charged and collected for inspection of any lot of product shall be \$4.00.

(c) Fees to be charged and collected for lot inspection services furnished on an hourly basis shall be based on the actual time required to render such service including, but not limited to, the



Interstate Commerce Commission

**TRUCK DETENTION CHARGES ON
TRIAL BASIS IN MIDDLE ATLANTIC AND
NEW ENGLAND TERRITORIES APPROVED:**

Mandatory truck detention charges by motor carriers operating in the middle Atlantic territory and between that territory and the New England territory were ordered by the Interstate Commerce Commission (I. C. C.)

travel, sampling, and waiting time required of the inspector, or inspectors, in connection therewith, at the rate of \$6.50 per hour for each inspector, except as provided in paragraph (b) (2) of this section.

2. Section 260.71 is hereby revised to read as follows:

§ 260.71 Inspection services performed on a resident basis.

Fees to be charged and collected for any inspection service, other than appeal inspection on a resident basis shall be those provided in § 260.70 and shall include such items as listed in this section as are applicable. The fees to be charged for appeal inspections shall be as provided in § 260.74.

(a) A charge for per diem and travel costs incurred by any inspector whose services are required for relief purposes when the regular inspector is on annual, sick, or military leave: *Provided*, That, with regard to military leave, charges for per diem and travel costs incurred by a relief inspector shall not exceed 15 days per calendar year.

(b) A charge to cover the actual cost to the Bureau of Commercial Fisheries of the travel (including the cost of movement of household goods and dependents), and per diem with respect to each inspector who is transferred (other than for the convenience of the Bureau of Commercial Fisheries), from an official station to the designated plant.

(c) A charge of \$6.50 per hour plus actual costs to the Bureau of Commercial Fisheries for per diem and travel costs incurred in rendering service not specifically covered in this section; such as, but not limited to, initial plant surveys.

3. Section 260.76 is hereby revised to read as follows:

**§ 260.76 Charges based on hourly rate
not otherwise provided for in this
part.**

When the appropriate Regional or Area Director determines that any inspection or related service rendered is such that charges based upon the foregoing sections are clearly inapplicable, charges may be based on the time consumed by the inspector in performance of such inspection service at the rate of \$6.50 per hour.

4. Section 260.77 is hereby revised to read as follows:

§ 260.77 Fees for score sheets.

If the applicant for inspection service requests score sheets showing in detail the inspection of each container or sample inspected and listed thereon, such score sheets may be furnished by the inspector in charge of the office of inspection serving the area where the inspection was performed; and such applicant shall be charged at the rate of \$2.75 for each twelve sample units, or fraction thereof, inspected and listed on such score sheets.

5. Section 260.78 is hereby revised to read as follows:

**§ 260.78 Fees for additional copies of
inspection certificates.**

Additional copies of any inspection certificate other than those provided for in § 260.29, may be supplied to any interested party upon payment of a fee of \$2.75 for each set of five (5) or fewer copies.

Notice of proposed rule making, public procedure thereon, and the postponement of the effective date of this revision later than February 1, 1963 (5 U.S.C. 1003), are impracticable, unnecessary and contrary to the public interest in that: (1) The Agricultural Marketing Act of 1946 provides that the fees charged shall, as nearly as possible, cover the cost of the service rendered; (2) the increases set forth herein are necessary to more nearly cover such cost, including but not limited to, increased salaries to Federal employees required by recent legislation; (3) it is imperative that the increase in fees become effective in time to meet such increased costs; (4) users of the inspection service were notified that the rates of fees to be charged for inspection service would be reevaluated as to need for readjustment with each Federal pay act increase by inclusion of § 260.81 into Part 260 Inspection and Certification and published in the *FEDERAL REGISTER* (27 F.R. 4781); and (5) additional time is not required by users of the inspection service to comply with this revision.

(Sec. 205, 66 Stat. 1000, as amended; 7 U.S.C. 1624)

Dated: January 14, 1963, to become effective at 12:01 a.m., February 1, 1963.

STEWART L. UDALL,
Secretary of the Interior.

JANUARY 14, 1963.

in a ruling issued December 19, 1962 (Docket No. 33434). Affected motor carriers must establish the prescribed charges on or before March 5, 1963, upon not less than 30 days notice to the general public and the I. C. C. The detention charges will apply when trucks are detained beyond a specified time for loading



and unloading. The charges were approved on a one-year trial basis.

Free time will be allowed for loading and unloading as follows: on shipments less than 24,000 pounds--4 hours; 24,000 to 35,999 pounds--5 hours; 36,000 pounds or more--6 hours. Additional free time ranging from 45 minutes for 5,000 pounds or less to 6 hours for 36,000 pounds or more will be allowed for truckload shipments stopped for completion of loading or partial unloading.

Detention charges for time in excess of free time will be calculated per vehicle on a graduated scale ranging from \$3.70 for 1 hour or less to \$33.10 for 4 hours. An additional charge of \$2.50 will be made for each 15 minutes or fraction thereof over 4 hours.

The ruling on detention charges will apply to vehicles which have been ordered or used to transport shipments subject to truckload rates. Where the tariff requires loading and unloading by the consignor and consignee, the rule applies when vehicles are delayed or detained through no fault of the carrier. Where the carrier is responsible for loading and unloading, the rule applies when vehicles are delayed or detained by the consigner or consignee, not including the time consumed by the carrier in actual loading and unloading. Computations of time are subject to, and are to be made within, the normal business (shipping or receiving) day of the consigner or consignee. When loading or unloading is not completed at the end of such day, time will be resumed at the beginning of the next such day. The rule applies only when a carrier furnishes its power unit(s). Where trailers are spotted for unloading or loading by consigner or consignee and carrier does not furnish power unit(s), the detention charge rule has no application.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

SPECIAL MINIMUM WAGE RATES FOR HANDICAPPED WORKERS IN SEAFOOD PLANTS TO BE CHANGED:

Special minimum wage rates for handicapped workers in seafood plants will be changed by the U.S. Labor Department in three stages--on April 1 and September 1, 1963, and April

1, 1964. Current minimum piece rates and minimum floor wage rates for handicapped workers will continue through March 31, 1963 (rather than January 31, 1963). Existing certificates will continue in effect automatically until March 31, 1963, to permit adequate time for instructions to reach the firms affected and for renewal applications to be submitted.



Treasury Department

INTERNAL REVENUE

FISHERMEN'S ESTIMATED INCOME TAX:

Fishermen will now receive the same treatment as farmers with respect to the estimated income tax. This means that, subject to certain rules, fishermen may wait until the end



of the tax year to file and pay their estimated income tax. The change was made by Public Law 87-682 and applies to taxable years which began after December 31, 1962.

An individual, who reports his income on the basis of a calendar year and whose estimated gross income from fishing for the taxable year is at least two-thirds of his total estimated gross income from all sources for the taxable year, now has the privilege of postponing the filing of a declaration of estimated tax from April 15 of the taxable year to January 15 of the following year, at which time the total estimated tax must be paid. His income tax return would then be due on or before April 15 of the year following the taxable year. In the alternative, he may elect to file his income tax return and pay the entire amount of his income tax on or before February 15 of the following year in lieu of filing a declaration of estimated tax.

The law also has provisions which provide comparable treatment for fishermen who file

their income tax returns on the basis of a fiscal year.

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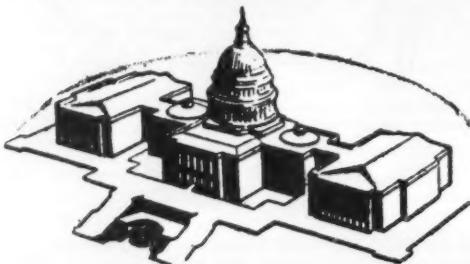
**NEW TAX FORMS REQUIRED FROM
U.S. STOCKHOLDERS IN FOREIGN FIRMS:**

United States taxpayers owning five percent or more of the stock of a foreign corporation will be required--under the Revenue Act of 1962--to file an information return on such holdings before March 31, 1963, the U. S. Treasury Department announced. The stockholder will only have to file such returns once, unless the corporation involved is reorganized, or unless his stock holdings change. This will be the first time a census has been taken of all United States taxpayers who hold a significant share in foreign corporations.



**Eighty-Eighth Congress
(First Session)**

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANADROMOUS FISH CONSERVATION: S. 759 (Engle) introduced in Senate Feb. 11, 1963, to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several States; referred to the Committee on Commerce. An identical bill H. R. 3779 (Miller) was introduced Feb. 14, 1963; referred to Committee on Merchant Marine and Fisheries.

COMMERCIAL FISHERIES FUND: H. R. 3738 (Rivers) introduced in House Feb. 11, 1963, to promote

State commercial fishery research and development projects, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

COMMODITY PACKAGING AND LABELING: H. R. 3769 (Halpern) and H. R. 3786 (Patman) introduced in House Feb. 14, 1963, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; referred to the Committee on the Judiciary.

DELAWARE RIVER BASIN: H. Doc. 522, Volumes V and IX, Delaware River Basin, New York, New Jersey, Pennsylvania, and Delaware (A letter from the Secretary of the Army transmitting a letter from the Chief of Engineers, Department of the Army, dated April 2, 1962, submitting a report, together with accompanying papers and illustrations, on a review of the Delaware River and tributaries, requested by a resolution of the Committee on Public Works, U. S. Senate, adopted April 13, 1950, and other resolutions of that Committee and of the Committee on Public Works, House of Representatives, listed in the report, House of Representatives, 88th Congress, 1st Session), 210 pp., illus., printed, and 285 pp., illus., printed, respectively. Volume V contains the report on the comprehensive survey of the water resources of the Delaware River Basin as prepared by the Fish and Wildlife Service, U. S. Department of the Interior for the Corps of Engineers. It presents data regarding the more important fish and wildlife resources of the basin, including related needs and problems, and also describes the probable effects that proposed water development projects will have on various fish and wildlife resources. It also includes a plan suggesting general means whereby fish and wildlife resources can be protected and improved for the enjoyment of present and future human populations of the basin and vicinity. Volume IX contains Appendix P, gross and net water needs; Appendix Q, formation of the plan of development; Appendix R, water control at intermediate upstream levels; and Appendix S, salt water barrier.

ECONOMIC REPORT: H. Doc. 28, Economic Report of the President (Transmitted to the Congress January 1963, together with the Annual Report of the Council of Economic Advisers, 88th Congress, 1st Session), 296 pp., printed. Contains the President's Economic Report to Congress, the 1961-62 Record, the outlook for 1963, tax reduction and reform in 1963, other economic measures, and policies for faster growth. Also contains the annual report of the Council of Economic Advisors to the President.

FISH FARMING LAND TREATMENT UNDER REVENUE CODE: H. R. 3825 (Mills) introduced in the House Feb. 14, 1963, to amend Section 175 of the Internal Revenue Code of 1954 to provide that land used for the production of fish shall be treated as land used in farming; referred to the Committee on Ways and Means.

FOOD-FOR-PEACE, AND FISH: S. 702 (Magnuson et al.) introduced in Senate Feb. 5, 1963, relating to domestically produced fishery products; referred to the Committee on Commerce. Provides that any domestically produced fishery product shall be available for the Food-for-Peace Program and distributed as a surplus agricultural commodity under the Agricultural Trade Development and Assistance Act of 1954, as amended, if the Director of the Food-for-Peace Program (or other appropriate official designated by the

President) determines that the utilization of such product will contribute to the success of the Food-for-Peace Program carried out under such act, and if the Secretary of the Interior determines that the utilization of such product will assist in the development of a fishery resource or segment of the fishing industry.

IMPORT COMMODITY LABELING: The House Committee on Ways and Means on February 11, 1963, ordered favorably reported H. R. 2513 (amended) to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes H. Rept. 33, Referred to the Whole House on the State of the Union.

MEDICAL CARE FOR VESSEL PERSONNEL: H. R. 3338 (Pelly) introduced in House Feb. 4, 1963, to provide medical care for certain persons engaged onboard a vessel in the care, preservation, or navigation of such vessel; referred to the Committee on Interstate and Foreign Commerce.

MEDICAL CARE FOR VESSEL OWNERS: H. R. 3873 (Pike) introduced in House Feb. 18, 1963, to amend section 322 of the Public Health Service Act to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service; referred to the Committee on Interstate and Foreign Commerce.

NATIONAL SCIENCE FOUNDATION: H. Doc. 39, Twelfth Annual Report of the National Science Foundation Fiscal Year 1962 (Message from the President of the United States Transmitting the Twelfth Annual Report of the National Science Foundation for the Fiscal Year Ended June 30, 1962, House of Representatives, 88th Congress, 1st Session), 385 pp., illus., printed. It is the annual report presented to Congress of the National Science Foundation. Included is the report on the International Indian Ocean Expedition, a scientific project of broad scope and magnitude designed to investigate one of the world's least-explored oceans. The study is under the auspices of the International Council of Scientific Unions and its Committee on Oceanographic Research, now coordinated by the Office of Oceanography of UNESCO. There are four major United States institutions participating in the program which are: Woods Hole Oceanographic Institution, Lamont Geological Observatory, the Narragansett Laboratories of the University of Rhode Island, and the Scripps Institution of Oceanography. The physical oceanography program will include chemical and isotopic analyses of water samples, measurement of current flow at various depths, and geophysical studies to aid in comprehending the nature of the sea floor and the crustal structure. The biological program is designed to increase knowledge of the abundance and distribution of living organisms and to gather information leading to a better understanding of the biological resources of the Indian Ocean. A new research vessel *Atlantis II*, was launched in September 1962 which will be used in the Indian Ocean Expedition, built with funds provided by the Foundation. Several grants were made during the fiscal year 1962 for various activities in oceanography and marine studies.

OUTDOOR RECREATION BUREAU: H. R. 3541 (Morris) introduced in House Feb. 7, 1963, to promote the coordination and development of effective Federal and State programs relating to outdoor recreation, and for other purposes; referred to the Committee on Interior and Insular Affairs.

PRICE-QUALITY STABILIZATION: H. R. 3669 (Harris), H. R. 3670 (Madden), H. R. 3690 (Harris), H. R. 3701 (Nelsen), H. R. 5143 (Tollefson), and H. R. 3745 (Mrs. May) introduced in House Feb. 11, 1963, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; referred to the Committee on Interstate and Foreign Commerce. Also H. R. 3790 (Pelly) and H. R. 3797 (Toll) introduced Feb. 14, 1963, and H. R. 3849 (Cederberg) and H. R. 3863 (Holifield), Feb. 18, 1963; referred to the Committee on Interstate and Foreign Commerce.

SALMON RIVER ANADROMOUS FISH: H. R. 3853 (Dingell) introduced in House Feb. 18, 1963, to provide for the conservation of anadromous fish and spawning areas in the Salmon River, Idaho; referred to the Committee on Interstate and Foreign Commerce.

SCIENCE AND TECHNOLOGY COMMISSION: S. 816 (McClellan et al) introduced in Senate Feb. 18, 1963, for the establishment of a Commission on Science and Technology; referred to the Committee on Government Operations. Commission would be composed of representatives from the legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. Provides for a study of all of the programs, methods and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs, with the objective of bringing about more economy and efficiency in the performance of these essential activities and functions.

SMITHSONIAN INSTITUTION & MARINE & AQUATIC BIOLOGICAL RESEARCH: H. R. 3499 (Dingell) introduced in House Feb. 7, 1963, to authorize expanded programs of marine and aquatic biological research by the Smithsonian Institution, and for other purposes; referred to the Committee on House Administration.

STERN RAMP TRAWLERS: S. 744 (Magnuson et al) introduced in Senate Feb. 7, 1963, to authorize the Secretary of the Interior to construct two modern stern ramp trawlers to be used for experimental commercial fishing, research, and for other purposes; referred to the Committee on Commerce.

SUBMERGED LANDS ACT: H. R. 3473 (Boggs), H. R. 3474 (Hebert), H. R. 3475 (Long), H. R. 3476 (Morrison), H. R. 3477 (Passman), H. R. 3478 (Thompson), H. R. 3479 (Waggoner), and H. R. 3480 (Willis) introduced in House Feb. 7, 1963, to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources within said boundaries; all referred to the Committee on the Judiciary.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: H. R. 2888 (Lankford) introduced in House Jan. 28, 1963, to provide for the conveyance of certain real property of the United States to the State of Maryland. Property affected includes the site of the Bureau

of Commercial Fisheries Technological Laboratory at College Park, Md. Bill referred to the Committee on Interior and Insular Affairs. A companion bill S. 673 (Beall & Brewster) was introduced in Senate Jan. 15, 1963; referred to the Committee on Interior and Insular Affairs.

TRADE EXPANSION ACT OF 1962: H. Doc. 51, Sixth Annual Report of the President of the United States on the Trade Agreements Program (A message from the President of the United States Transmitting the Sixth Annual Report on the Operation of the Trade Agreements Program, Pursuant to Section 402 (a) of the Trade Expansion Act of 1962, 88th Congress, 1st Session, 103 pp., printed. Contains the following: (I) Developments in international trade in 1961; (II) The trade agreements program and GATT; (III) United States tariff negotiations; (IV) The safeguarding procedures of the trade agreements program; (V) The Removal of restrictions against U.S. exports; (VI) Developments in regional associations; and Appendices A, B, and C.

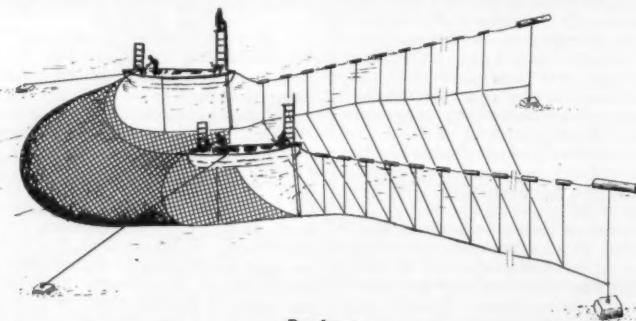
WATER POLLUTION CONTROL ADMINISTRATION: H. R. 3819 (Johnson of Wisconsin) introduced in the House Feb. 14, 1963, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to increase grants for construction of municipal sewage treatment works, to provide financial assistance to municipalities and others for the separation of combined sewers, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate or navigable waters, and for other purposes; referred to the Senate and House Committee on Public Works. Also H. R. 3867 (McFall) introduced Feb. 18, 1963; referred to Committee on Public Works.

WATER POLLUTION CONTROL AID TO INDUSTRY: S. 737 (Ribicoff et al) introduced in Senate Feb. 7, 1963, to promote water and air pollution control and abatement by authorizing the Secretary of Health, Education, and Welfare to provide certain assistance to small business concerns in obtaining necessary treatment works; referred to the Committee on Public Works.



REEF NET

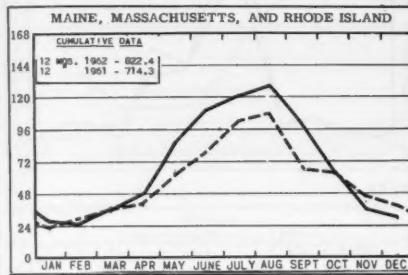
This type of fishing gear is used, mainly by Indians, in the State of Washington. It is fished between the reefs of Puget Sound for salmon. When the salmon are observed to have passed over the square netting in front of the rectangular bunt, the weighted lead line of the square is raised quickly to the surface, impounding the fish. The salmon are guided into the net by leads of ropes.



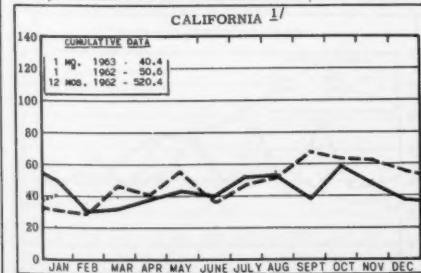
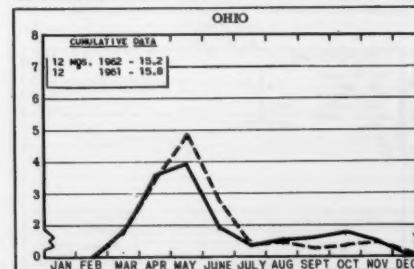
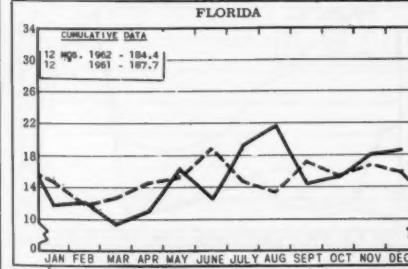
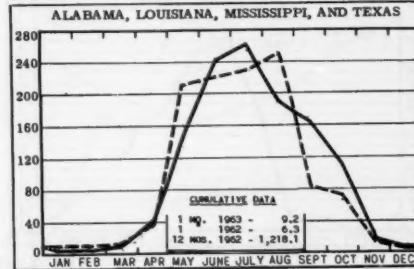
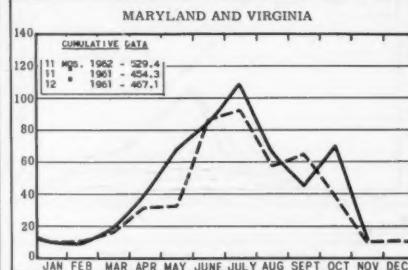
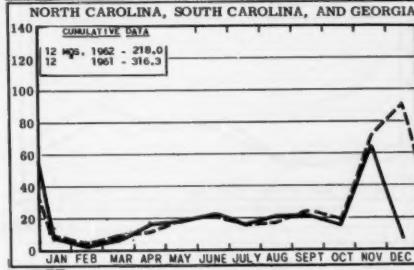
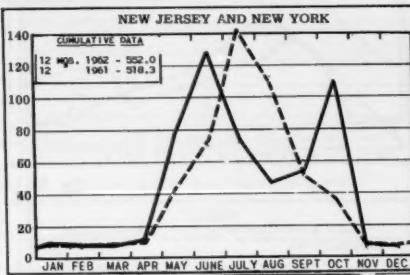
Note: Excerpt from Circular 109, Commercial Fishing Gear of the United States, for sale from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., single copy, 40 cents.

FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES In Millions of Pounds



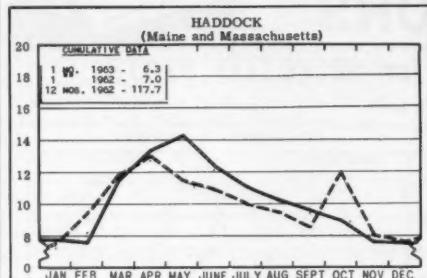
LEGEND:
1963
1962
1961



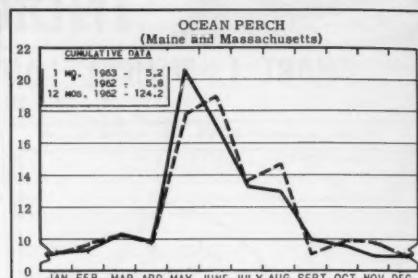
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

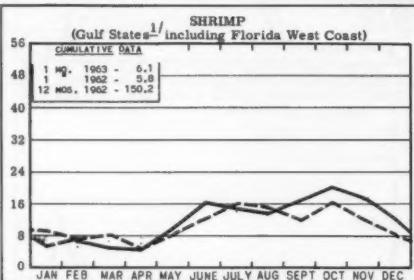
In Millions of Pounds



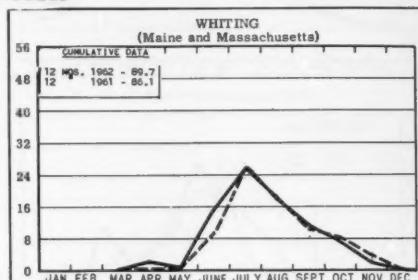
LEGEND:
***** 1963
— 1962
- - - 1961



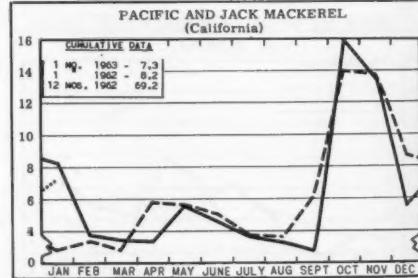
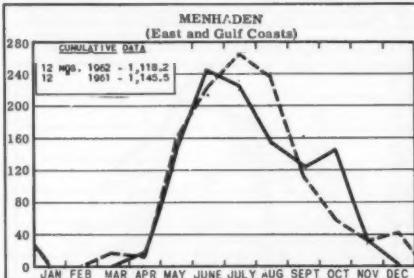
In Millions of pounds



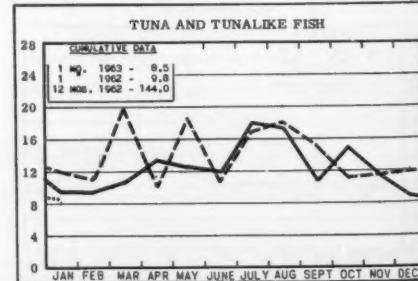
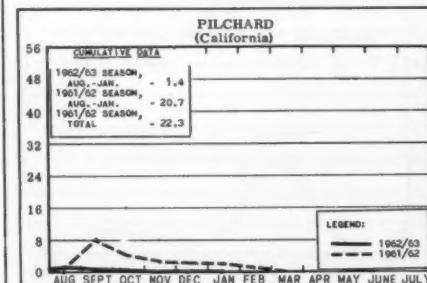
^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.



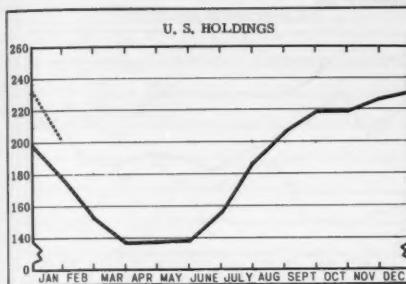
In Thousands of Tons



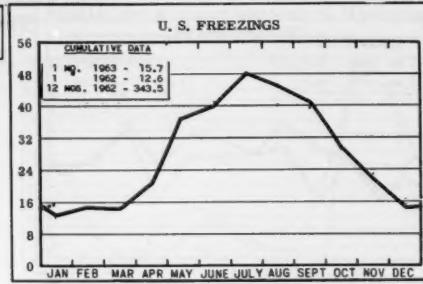
In Thousands of Tons



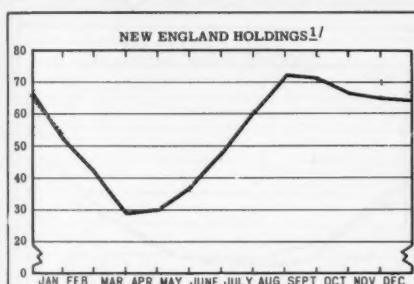
**CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS
of FISHERY PRODUCTS ***
In Millions of Pounds



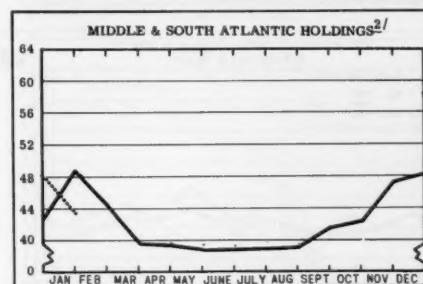
LEGEND:
1963
1962



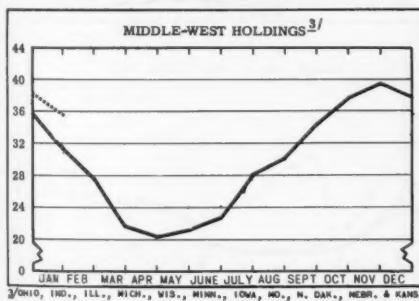
CUMULATIVE DATA
1 MG. 1963 - 15.7
1 MG. 1962 - 12.6
12 MG. 1962 - 343.5



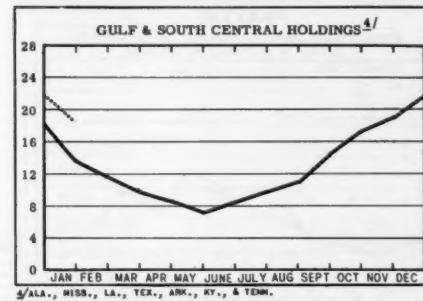
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



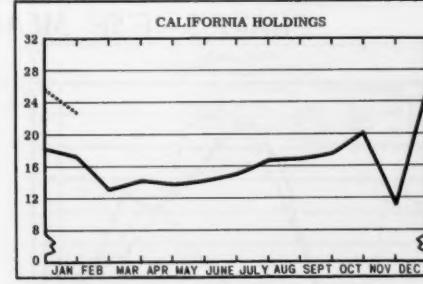
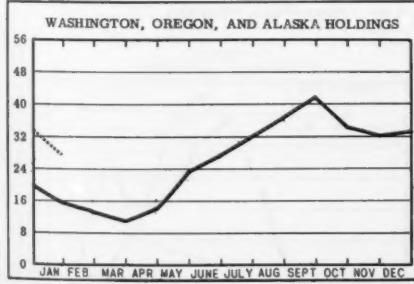
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



^{3/}OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.



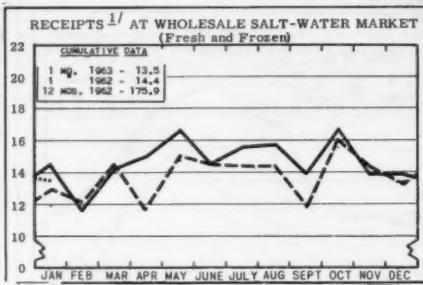
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



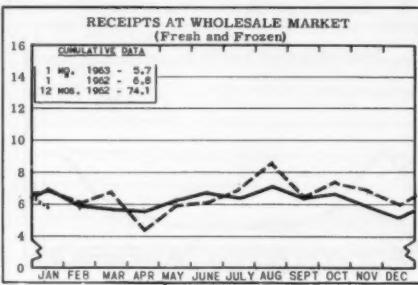
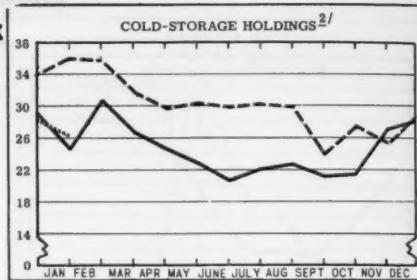
* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

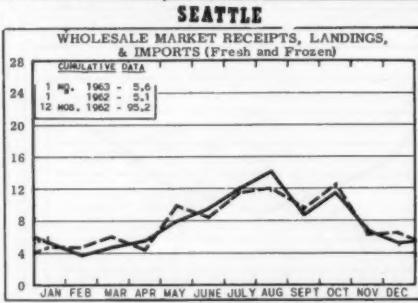
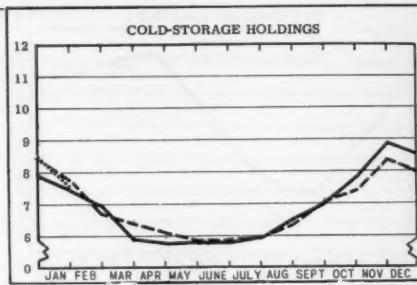
In Millions of Pounds



NEW YORK CITY



CHICAGO



LEGEND:
1963
1962
1961

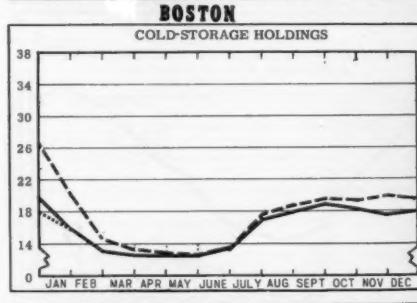


CHART 5 - FISH MEAL and OIL PRODUCTION

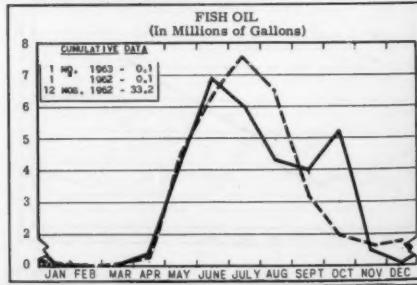
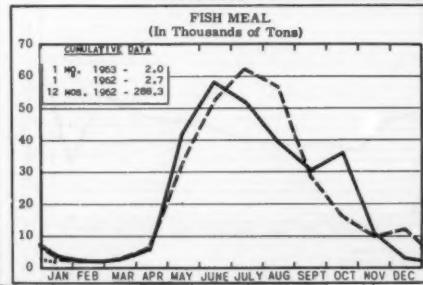
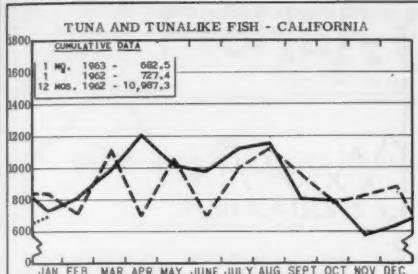
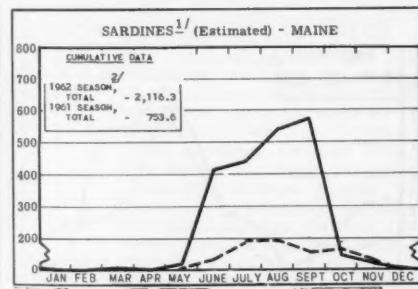
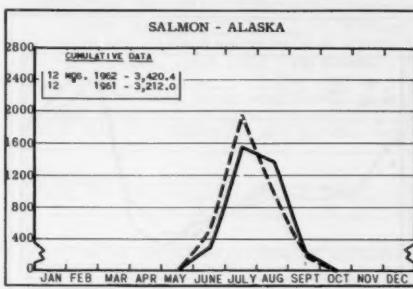
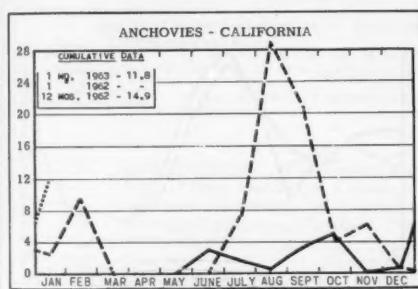
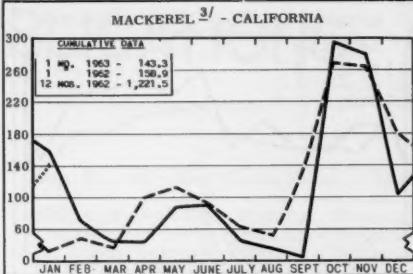


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



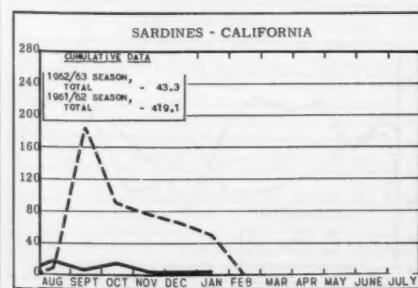
LEGEND:
 ----- 1963
 - - - 1962
 - - - 1961



^{1/} INCLUDING SEA HERRING. ^{2/} THE 1962 SEASON STARTED DEC. 2, 1961.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES	100	½ drawn	3 ½ oz.
SHRIMP	48	--	5 oz.
TUNA	48	# ½ tuna	6 & 7 oz.
PILCHARDS	48	# 1 oval	15 oz.
SALMON	48	1-lb. tall	16 oz.
ANCHOVIES	48	½-lb.	8 oz.



LEGEND:
 - - - 1963/64
 - - - 1962/63
 - - - 1961/62

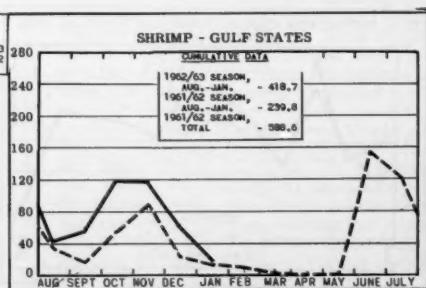
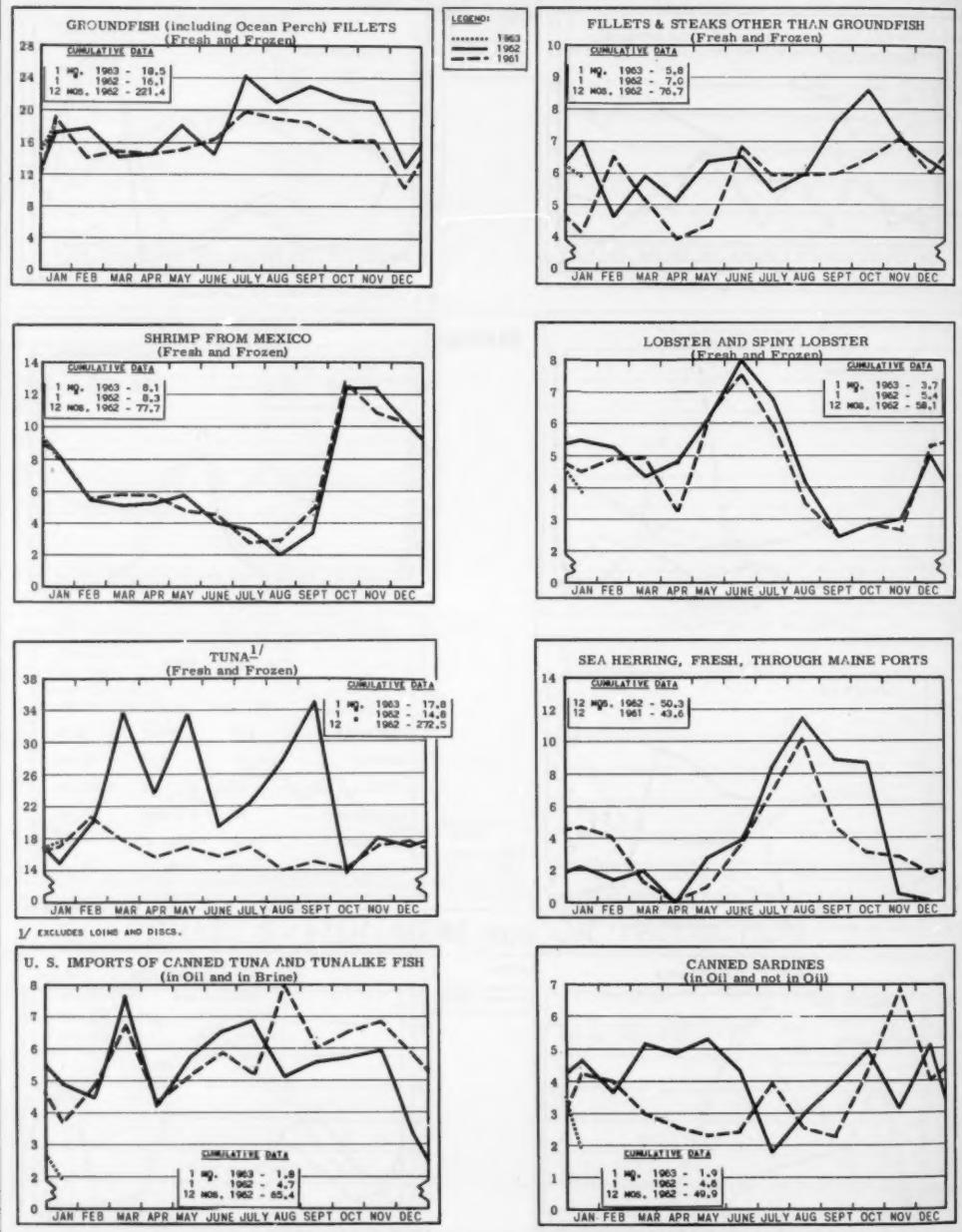


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
ML - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3051	Gulf Fisheries, 1961 Annual Summary, 13 pp.
CFS-3052	New Jersey Landings, October 1962, 4 pp.
CFS-3054	Alabama Landings, September 1962, 3 pp.
CFS-3055	Georgia Landings, October 1962, 2 pp.
CFS-3056	North Carolina Landings, October 1962, 4 pp.
CFS-3060	Frozen Fish Report, November 1962, 8 pp.
CFS-3061	South Carolina Landings, October 1962, 2 pp.
CFS-3064	Massachusetts Landings, July 1962, 5 pp.
CFS-3065	Texas Landings, September 1962, 3 pp.
CFS-3066	Michigan Landings, September 1962, 3 pp.
CFS-3067	Wisconsin Landings, October 1962, 2 pp.
CFS-3068	Virginia Landings, October 1962, 4 pp.
CFS-3069	California Landings, September 1962, 4 pp.
CFS-3070	Ohio Landings, September 1962, 2 pp.
CFS-3071	New York Landings, October 1962, 4 pp.
CFS-3072	Mississippi Landings, October 1962, 3 pp.
CFS-3074	Texas Landings, October 1962, 3 pp.
CFS-3075	New Jersey Landings, November 1962, 4 pp.
CFS-3076	Louisiana Landings, October 1962, 2 pp.
CFS-3077	Rhode Island Landings, October 1962, 3 pp.
CFS-3079	Alabama Landings, October 1962, 3 pp.
CFS-3081	North Carolina Landings, November 1962, 4 pp.
CFS-3083	Ohio Landings, October 1962, 2 pp.
CFS-3084	Fish Meal and Oil, November 1962, 2 pp.
CFS-3085	South Carolina Landings, November 1962, 2 pp.
CFS-3086	Georgia Landings, November 1962, 2 pp.
CFS-3087	Michigan Landings, October 1962, 3 pp.
CFS-3088	Wisconsin Landings, November 1962, 2 pp.
CFS-3089	Louisiana Landings, November 1962, 2 pp.
CFS-3090	Ohio Landings, November 1962, 2 pp.
CFS-3091	Maryland Landings, November 1962, 3 pp.
CFS-3092	Mississippi Landings, November 1962, 3 pp.
CFS-3150	Advance Report on the Fisheries of the United States, 1962, 25 pp.

FL-508 - Whirling Disease of Trout, by Glenn Lyle Hoffman, 3 pp., May 1962 (Revised).

Sep. No. 667 - A Trawling Survey of Southern Lake Michigan (August-November 1960).

Sep. No. 668 - Gulf States Shrimp Canning Industry.

SSR-Fish. No. 420 - Physical, Chemical, and Biological Observations in the Eastern Tropical Pacific Ocean: Three Cruises to the Gulf of Tehuantepec. 1958-59. by Maurice Blackburn and others, 173 pp., illus., July 1962

SSR-Fish. No. 429 - Estimating Abundance of Pink and Chum Salmon Fry in Prince William Sound. 1957. by Howard D. Tait and James B. Kirkwood, 23 pp., illus., processed, June 1962.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, SUITE 611, WYATT BLDG., 277 14TH ST. NW, WASHINGTON 5, D. C.

Number	Title
MNL-76	Japan's Exports of Frozen and Canned Tuna, 1961 and January-June 1962, 20 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products. November 1962, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore 2, Md.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, November and December 1962, 18 and 20 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the months indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, October and December 1962, 10 pp. ea., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the months indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, November and December 1962, 14 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 South Canal St., Room 1014, Chicago 7, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, November and December 1962, 8 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, December 1962 and January 1963, 4 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the months indicated.

New England Fisheries--Monthly Summary, November and December 1962, 23 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--November 1962, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Includes summaries and analysis of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, December 1962 and January 1963, 7 pp. ea. (Market News Service, U. S. Fish and Wild-

life Service, 706 Federal Office Bldg., 909 First Ave., Seattle 4, Wash.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Halibut Commission; landings by otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the months indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

Accumulation and Retention of Cesium 137 by Marine Fishes, by John P. Baptist and Thomas J. Price, Fishery Bulletin 206 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 62, pp. 177-187), 15 pp., illus., printed, 15 cents, 1962.

"The Deposition of Tetracycline Drugs in Bones and Scales of Fish and Its Possible Use for Marking," by Douglas D. Weber and George J. Ridgway, article Progressive Fish-Culturist, vol. 24, no. 4, October 1962, pp. 150-155, illus., processed, 25 cents.

Fish, Wildlife, and Clean Water, 19--Catalog No. FS 2.64/3:F 52/1962, 8 pp., printed, 5 cents, revised 1962. Pollution is a growing problem to 50 million American sports fishermen and hunters. This leaflet is intended to show the extent of this problem and its impact on our fish and wildlife.

"Studies of Transmission of Mycobacterial Infections in Chinook Salmon," by A. J. Ross and H. E. Johnson, article Progressive Fish-Culturist, vol. 24, no. 4, October 1962, pp. 147-149, processed, 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AFRICA:

A Note on the Fisheries of Tropical Africa, FAO Fisheries Paper No. 20, 11 pp., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, 1961.

ALGAE:

"Carbohydrates and Nucleotides in the Red Alga, Porphyra perforata, I--Isolation and Identification of Carbohydrates," and "II--Separation and Identification of Nucleotides," by Jong-Ching Su and W. Z. Hassid (University of California, Berkeley), articles Biochemistry, vol. 1, May 1962, pp. 468-480, printed. American Chemical Society, 1155 16th St. NW, Washington 6, D. C.

"Nitrogen Compounds of Algae," by G. P. Serenkov and M. V. Pakhomova, article, Vestnik Moskovski

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Universitet Serie VI: Biologia Pochvoved, vol. 15, no. 6, 1960, pp. 15-25, printed in Russian. MGU, Leninskiye gory, Moscow, U.S.S.R.

"Studies on the Compounds Specific for Each Group of Marine Algae. I--Presence of Characteristic Ultraviolet-Absorbing Material in Rhodophyceae," and "II--Extraction and Isolation of Characteristic Ultraviolet-Absorbing Material in Rhodophyceae," by Isami Tsujino and Tsuneyuki Saito, articles, Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 12, May 1961, pp. 49-65, printed. Hokkaido University, Kameda-Machi, Hakodate, Japan.

BACTERIOLOGY:

"Bacteriology: Collection of Marine Bacteria," article, Torry Research Station, Annual Report 1960, pp. 28-29, printed. Torry Research Station, Aberdeen, Scotland, 1961.

"Bacteriology: Effect of Temperature on the Multiplication of Marine Bacteria," article, Torry Research Station, Annual Report 1960, pp. 29-30, printed. Torry Research Station, Aberdeen, Scotland, 1961.

Commensal Bacteria of Marine Animals--A Study of Their Distribution, Physiology and Taxonomy, by R. B. R. Colwell, Dissertation for Ph.D., 225 pp., printed. University of Washington, Seattle, Wash., 1961.

BASS:

The Largemouth Bass: Its Life History, Ecology and Management, by Donald Mraz, Stanley Kmiotek, and Ludwig Frankenberger, Publication No. 232, 15 pp., illus., printed. Wisconsin State Conservation Department, Madison, Wis., 1961.

BLUEGILL:

The Bluegill: Its Life History, Ecology and Management, by Howard Snow, Arthur Ensign, and John Klingbiel, Publication No. 230, 14 pp., illus., printed. Wisconsin State Conservation Department, Madison, Wis., 1960.

BRAZIL:

"Decree No. 50,872 Establishing the Fisheries Development Council and Making Other Provisions," FAO--Food and Agricultural Legislation, vol. XI, no. 1, September 1, 1962, Brazil, XVIII/I, 10 pp., printed, \$1. Columbia University Press, International Document Service, 2960 Broadway, New York 27, N. Y. Covers the provisions of Brazil Decree No. 50,872, June 28, 1961 (Diario Oficial, Year C, No. 144, June 28, 1961, p. 5849). Describes the establishment of the Fisheries Development Council (Conselho de Desenvolvimento da Pesca--CODEPE), its aims, component bodies and their functions, and related information.

CANADA:

Annual Report of the Fisheries Research Board of Canada, 1961/62 (For the Fiscal Year Ended March 31, 1962), 206 pp., illus., printed in English, introduction also in French, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1962. A comprehensive summary of the work of the Fisheries Research Board of Canada

and its field stations during 1961/62. The research work of the Board is divided into three principal areas: aquatic biology with emphasis on fishery biology, fishery technology, and oceanography. Cooperative programs with other Canadian as well as international agencies were conducted during the year. A new research vessel was under construction and another in the planning stage. Oceanographic studies in Atlantic, Arctic, and Pacific waters are described in the report. Also covered are activities of the Board's biological and technological stations. A list of the publications and reports published during 1961 by the Board is included.

Journal of the Fisheries Research Board of Canada, vol. 19, no. 6, November 1962, 205 pp., illus., printed, single copy C\$1.50. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, articles on: "Bacteriological Studies of Freshwater Fish. II--Furunculosis in Ontario Fish in Natural Waters," by L. Rabb and L. A. McDermott; "Relation between Water Temperature and Gastric Digestion of Large-Mouth Bass (Micropterus salmoides Lacepede)," by Gyula Molnar and Istvan Toig; "The Occurrence of the Longjaw Cisco, Leucichthys alpenae, in Lake Erie," by W. B. Scott and Stanford H. Smith; "Some Considerations in the Study of Respiratory Metabolism in Fish, Particularly Salmon," by J. R. Brett; "An Improved Method for the Preparation of Fish Protein Concentrate from Cod," by H. E. Power; "Aggressive Behavior in Juvenile Coho Salmon as a Cause of Emigration," by D. W. Chapman; "The Free Fatty Acids of Cod Oil, 1-Anomalous Composition by Fatty Acid Chain Length," by R. G. Ackman, R. D. Burgher, and M. L. Hughes; "The Relative Efficiency of Nylon and Cotton Gill Nets for Taking Lake Trout in Lake Superior," by Richard L. Pycha; "The Enzymic Digestion of Cod Tropomyosin," by B. Truscott and others; "Amphipods in Low-Oxygen Marine Waters Adjacent to a Sulphite Pulp Mill," by M. Waldichuk and E. L. Bousfield; "Range Extension for Two Species of Caridean Shrimps (Order Decapoda) from the Northeastern Pacific," by Lael L. Ronholt; "Egg Masses and Early Development Stages of the Scorpaenid Fish, Sebastolobus," by W. G. Pearcy; and "Age of Young Sablefish, Anoplopoma fimbria (Pallas) 1811," by H. Skeyamoto.

Progress Reports of the Atlantic Coast Stations, no. 73, 73 pp., illus., printed in English with summaries in French, 75 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, August 1962. Contains, among others, the following articles: "The Utilization of Fish Skins for Glue and Other Products," by A. Guttmann; "Sea Temperatures Along the Canadian Atlantic Coast, 1958-1960," by L. M. Lauzier and J. H. Hull; and "Salt-Fish Flavour in Frozen Cod Fillets Prepared from Stored Frozen Shore Cod Thawed in Sea Water," by W. J. Dyer and others.

CLAMS:

"The Quahog," by Robert E. Hillman, article, Estuarine Bulletin, vol. 7, no. 1, January 1963, pp. 13-15, illus., printed. University of Delaware, Department of Biological Sciences, Newark, Del. The Northern Quahog, Mercenaria mercenaria, unlike other sand-dwelling clams, has a self-cleansing process which

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enables it to free itself of debris. Epicures who relish the cherry stone stage of this clam note that it rarely contains sand. The quahog has a unique fourth fold in its mantle which traps foreign particles, wraps them in mucous, and exudes them between the mantle margins out across the shell.

COMPOSITION:

"Mineralnyi sostav nekotoryh vidov ryby i proverka sootnoseniya mezdu soderzaniem mineral'nyh elementov i belka" (Mineral Composition of Some Species of Fish and Relations between Contents of Minerals and Proteins), by E. N. Vasil'eva, N. E. Diubik, and T. D. Lycnikova, article, *Voprosy Pitaniia*, vol. 20, no. 2, 1961, pp. 54-59, printed in Russian with English summary. *Voprosy Pitaniia*, Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Moscow, U.S.S.R.

"Soderzanie mineral'nia elementov v miase ryb" (Mineral Content of Fish Flesh), by N. E. Kasinova, article, *Voprosy Pitaniia*, vol. 20, 1961, pp. 74-77, printed in Russian with English summary. *Voprosy Pitaniia*, Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Moscow, U.S.S.R.

"Total Solids and Ether Extract in Fish and Other Marine Products," by H. M. Risley, article, *Journal of the Association of Official Agricultural Chemists*, vol. 45, May 1962, pp. 259-261, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington 4, D. C.

CRAB MEAT:

Preservation of Canned Crab, British Patent, 870,926, June 21, 1961, printed. British Patent Office, 25 Southampton Bldgs., London WC2, England.

"The Prevention of Blue Discoloration of Frozen Crab Meat and Canned Crab Meat by Fractional and Low Temperature Cooking Methods," by I. Osakabe, article, *Refrigeration (Japan)*, vol. 36, no. 409, November 1961, pp. 18-49, illus., printed in Japanese with English summary. *Refrigeration*, Japanese Association of Refrigeration, Kenchiku Kaikan Bldg., 3-1 Ginza Nishi, Chuo-ku, Tokyo, Japan.

CRABS:

A Partial Bibliography on Some Crabs of Commercial Importance, by M. A. Benarde, FAO Fisheries Biology Technical Paper No. 17, 5 pp., processed. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy, 1961.

DEFROSTING:

"Electronics Speed Defrosting," by John Grindrod, article, *Food Engineering*, vol. 34, May 1962, p. 128, printed. Chilton Company, Chestnut and 46th Sts., Philadelphia 36, Pa.

DENMARK:

Kongeriget Danmarks Fiskeribank--Beretning og Regnskab for 29. Regnskabsar (1. April 1961-31. Marts 1962) (Kingdom of Denmark Fisheries Bank--Report and Statement for 29th Fiscal Year--April 1, 1961-March 31, 1962), 8 pp., printed in Danish. Kongeriget Danmarks Hypotekbank, Niels Juels Grade 5, Copenhagen K, Denmark.

DRYING:

"Solar Drying Devices May Save Money in Fishing," article, *Canadian Fisherman*, vol. 48, no. 10, 1961, p. 23, printed. *Canadian Fisherman*, National Business Publications Ltd., Gardenvale, Quebec, Canada.

EAST AFRICA:

Annual Report of the East African Marine Fisheries Research Organization, 1961, 17 pp., illus., printed, 4s. (about 56 U.S. cents). East African Common Services Organization, Zanzibar, Zanzibar, 1962. Discusses activities of the East African Marine Fisheries Research Organization during 1961; the Organization's research vessels; Rockefeller Foundation grant; and the International Indian Ocean Expedition. Also covers the scientific work accomplished: pelagic fish--deep long-line operations, surface shoaling fish, and sardine investigations; demersal fish--fisheries of the North Kenya Coast; inshore and estuarine fisheries--shrimps, spiny lobsters, crustacean taxonomy and biology, and fish stomach contents; plankton studies; and hydrological investigations.

EGYPT:

Import Tariff System of Egypt (U.A.R.), by Robison H. Barber, OBR-62-8, 2 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers units of currency, weights, and measures; ad valorem duties; specific duties; method of payment of duty; and sales and other internal taxes. Also discusses preferential duties, consular documents and fees, trade restrictions, and special regulations.

FACTORYSHIP:

"Large Japanese-Built Refrigerating Factory Ship," article, *Motor Ship*, vol. 42, no. 495, 1961, pp. 304-306, illus., printed. *Motor Ship*, Temple Press Ltd., Bowring Green Lane, London EC4, England.

FILLETS:

"Fat Hydrolysis in Frozen Fillets of Lingcod and Pacific Gray Cod," by J. D. Wood and S. A. Haqqi, article, *Journal of the Fisheries Research Board of Canada*, vol. 19, no. 1, January 1962, pp. 169-171, illus., printed. *Journal of the Fisheries Research Board of Canada*, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada. (For sale by Queen's Printer and Controller of Stationery, Ottawa, Canada.)

FISH AS EXPERIMENTAL ANIMALS:

Maintaining Fishes for Experimental and Instructional Purposes, by William M. Lewis, 100 pp., illus., printed, \$5.00 cloth, \$1.45 paper. Southern Illinois University Press, Carbondale, Ill., January 1963. The selection and maintenance of fish for experimental purposes has always been a problem for research workers. Fish as experimental animals have contributed to our knowledge not only of fish but of animal science in general. There isn't too much information readily available on the use of fish as experimental animals. The author, in my opinion, has succeeded in bringing together some of the important elements (like nutrition, disease, and the artificial maintenance of suitable environmental conditions) associated with this problem. Only fresh-water

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fish are covered. After a discussion of the types of waters and fish-holding procedures, there is a chapter on the aquarium building and another on the selection of experimental fish. Food, diseases, parasites, and special problems in handling fish are covered. There are chapters on aquarium plants and other miscellaneous considerations (including control of reproduction, anesthetization, sterilization of tanks and equipment); chemical variables of aquarium water and their determination; and the transport of live fish. An appendix contains a number of conversion tables. The literature cited section seems to contain the relevant literature on the subject of the book. An index is also included. This book would be useful to anyone maintaining live fish for experimental or other purposes.

--Joseph Pileggi

FISH COOKERY:

Catch 'em and Cook 'em, by Bunny Day, 111 pp., illus., printed. Doubleday and Company, Inc., Garden City, N. Y., 1961. Presents, with flashes of wit, information on catching, opening, cleaning, and cooking shellfish. Includes sections on clams, crabs, lobster, mussels, oysters, and scallops. Also includes lists of gadgets for cooking and catching shellfish, and recipes for a bouillabaisse and shellfish sauces.

FISH CULTURE:

"Foundation Studies in Culturing of the Japanese Loach, *Misgurnus anguillicaudatus* (Cantor). III--Storing of Spermatozoon," by Z. Kubota; and "V--Sex Reversal Induced by Follicular Hormone," by Z. Kubota and others, articles, *Journal of the Shimonoseki College of Fisheries*, vol. II, no. 1, 1961, pp. 247-269, and pp. 287-295, respectively, illus., printed in Japanese with English summary. Shimonoseki College of Fisheries, Jamaguchi Prefecture, Yoshimi, Shimonoseki, Japan.

FISH FINDER:

"Explorator" a French Horizontal Shoal Detector," article, *Norwegian Fishing and Maritime News*, vol. 9, no. 2, 1962, pp. 33, 35, printed. Norwegian Fishing and Maritime News, Torolf Holme, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

FISH LIVERS:

"Sterylizatsia pecheni treski v balonakh na trauleire i prigotovlenie iz nee konservov" (Sterilization of Cod Livers Aboard and the Production of Cod Liver Preserves), by K. A. Mrochkov, article, *Trudy Tekhnologiya Rybnykh Produktov*, vol. 60, 1959, pp. 38-45, illus., printed in Russian. Four Continent Book Corp., 156 5th Ave., New York 10, N. Y.

FISH OIL:

"The Effect of Fish-Oil Fraction on Plasma Lipids," by L. W. Kinsell and others (Institute for Metabolic Research, Oakland, Calif.), article, *Diabetes*, vol. 10, 1961, pp. 316-319, printed. American Diabetes Association, 1 E. 45th St., New York 17, N. Y.

"A Hypercholesterolemic Factor in Marine Sterols," by E. Reiner, D. R. Idler, and J. D. Wood, article, *Canadian Journal of Biochemistry and Biophysics*, vol. 38, 1960, pp. 1499-1550, printed. Canadian Journal of Biochemistry and Biophysics, National Research Council, Ottawa, Canada.

FISH PROTEIN CONCENTRATE:

"Microbiological Process for the Production of a Bland Fish Meal," by S. G. Wiechers, F. Schweigart, and M. K. Rowan, article, *Research Report, Council of Scientific and Industrial Research, South Africa*, No. 179, 1960, 21 pp., printed. Council of Scientific and Industrial Research, P. O. Box 395, Pretoria, South Africa Republic.

"Preparation of Edible Fish Flour from Oil-Sardine (*Clupea longiceps*)," by N. L. Lahiry and others, article, *Food Science (India)*, vol. 11, 1962, pp. 37-39, printed. Central Food Technological Research Institute, Mysore, India.

"Preparation of Protein-Rich Biscuit with Fish Flour from Hammer-Head Shark (*Zygoena blochii*)," by R. L. Nath, N. K. Ghosh, and R. Dutt, article, *Bulletin, Calcutta School of Tropical Medicine*, vol. 9, 1961, pp. 12-13, printed. Calcutta School of Tropical Medicine, Chittaranjan Ave., Calcutta 12, India.

"Use of Fish-Protein Hydrolysate in the Diet. I--Preparation of Biscuit from Protein Hydrolysate of Fish," by R. L. Nath, S. K. Pain, and R. Dutt, article, *Journal and Proceedings of the Institution of Chemists (India)*, vol. 33, 1961, pp. 64-68, printed. Chemical Department, Medical College, Calcutta 12, India.

FISH SAUSAGE:

"Fish Sausage Processing in Japan," by Keishi Amano (Marine Food Preservation Division, Tokai Regional Fisheries Research Laboratory, Ministry of Agriculture and Forestry, Tokyo, Japan), article, *Fishing News International*, vol. 1, no. 5, October 1962, pp. 29-30, 32-34, illus., printed, single copy 6s. 6d. (about 91 U. S. cents). *Fishing News International*, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Discusses the increased production of fish sausage in Japan since 1954, raw materials used, steps in preparation and processing, recipes, shelf life of the product, quality control, and chemical composition.

FISH SOLUBLES:

Animal Feed from Fish Solubles, by J. Kruss, U. S. Patent No. 2, 986,469, May 30, 1961, printed. U. S. Patent Office, Washington 25, D. C.

Studies on an Unidentified Growth Factor (UGF) for Chicks in Fish Solubles (Paper presented at the 50th Annual Meeting of the Poultry Science Association, Pennsylvania State University, August 8-11, 1961), by F. H. Steinke, H. R. Bird, and F. M. Strong, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio. (Abstract in *Poultry Science*, vol. 40, 1961, pp. 1460-1461.)

FISH STICKS:

"Microbial Analysis of Commercial Frozen Fish Sticks," by J. T. R. Nickerson and others (Massachusetts Institute of Technology, Cambridge, Mass.), article, *Journal of Milk and Food Technology*, vol. 25, no. 2, 1962, pp. 45-47, printed. International Association of Milk and Food Sanitation, Box 437, Shelbyville, Ind.

FOOD:

"Chemical Opening of Bivalves for the Removal of Edible Meats," by Clyde J. Welcker and Roland L.

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Welcker, article, *Chemical Abstracts*, vol. 56, April 2, 1962, 77611. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

Fish as Food. Vol. II--Nutrition, Sanitation, and Utilization, edited by Georg Borgstrom, 794 pp., illus., printed, \$25. Academic Press Inc., 111 Fifth Ave., New York 3, N. Y., November 1962. This is the second of a three-volume work which reviews today's science of fish as food (covers all marine and fresh-water organisms used as food). The basic fields of production, biochemistry, and microbiology were reviewed in the first volume. Presented in this second volume are the "public health" aspects of fish, its handling and processing. Covered are the major areas of nutrition, sanitation, and utilization. The historical aspects of fish are discussed in the first chapter. The section on nutrition covers the nutritive aspects of fish and shellfish protein (including protein content, amino acid composition, digestibility, fish flour, fish and shellfish meals, fish solubles, and whale protein). Also, the same section discusses nutritive aspects of fish oils, fat-soluble vitamins, fish as a source of mineral nutrition, and changes in nutritive value through handling and processing procedures. Following a chapter on fish in world nutrition are chapters on the role of fishery foods in the Japanese diet; fish meal and condensed solubles in poultry and livestock feeding; and fish for feeding minks. The sanitation section reviews food poisoning caused by fish and fishery products; fish-borne food poisoning in Japan; polluted waters and the contamination of fish; salmonella problems in the sea; biotoxins, allergies, and other disorders; diseases of marine and fresh-water fish; transportation of live fish; and radioactivity and seafood. The section on trends in utilization of fish and shellfish includes all types of fishery products, utilization patterns in selected countries, waste utilization, trade patterns, and many other phases. Very successfully the book maps the alternative ways that fish, as food, reaches the consumer as well as the relative significance of major preserving and processing methods. In the preface, the author points out: "The prevailing idea that fisheries contribute little to human feeding is substantially revamped when the character of fish as a rich source of protein and its great marginal effect in amino acid supplementation is properly considered." Besides a subject index, this volume contains a list of common food fish, and each chapter is followed by a list of references. This particular volume as well as the first volume should be valuable to fish and food scientists, public health workers, fishery biologists, nutritionists, sanitary engineers, and to anyone interested in any phase of fish and shellfish production and processing. No fishery library will be complete without this set of books, to which most of the world's leading fish scientists have contributed. Of particular importance is the inclusion of Soviet and Japanese studies previously unavailable in English. (See *Commercial Fisheries Review*, September 1962, p. 132, for review of Volume I.)

--Joseph Pileggi

FOOD AND AGRICULTURE ORGANIZATION:
Yearbook of Fishery Statistics, 1960-61 (International Trade), vol. XIII, 539 pp., processed in English,

French, and Spanish, \$5. Food and Agriculture Organization of the United Nations, Rome, Italy, 1962. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) The present biennial issue brings up to date the statistics relating to international trade in fishery products, up to and including the 1960-61 biennium. The coverage of this volume has been extended by adding approximately 20 countries now comprising import and export data for 125 countries or customs territories. Mainland China remains the only fishing country with significant exports still omitted from the Yearbook. According to the report, the volume of international fishery trade in 1961 was over 4,300,000 tons and its value between \$1,300 and \$1,400 million. Into these 4,300,000 tons of fishery products went approximately 11,800,000 tons of fish as they come out of the water, i.e., one third of the estimated world catch for 1961.

Yearbook of Fishery Statistics, 1961 (Production), vol. XIV, 423 pp., illus., processed in English, French, and Spanish, \$4.50. Food and Agriculture Organization of the United Nations, Rome, Italy, 1962. (For sale by the Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) This edition contains all sections that appeared in the 1960 edition except for that pertaining to fishing craft. It covers fishery statistics on catches, production of preserved and processed commodities, and whaling by countries. It reports that "The total nominal catch of fish, crustaceans and molluscs and other aquatic animals (except seals and whales), residues and aquatic plants, throughout the world in 1961 is estimated at over 41 million metric tons, an increase of 8 percent over the nominal catch of 1960, and is once more greater than in any other year. Out of this total of over 41 million tons, nearly 10 million tons were used for the manufacture of fish meals for animal feeding, and approximately another million tons for miscellaneous purposes. The balance of approximately 30 million tons was used for human food in fresh, frozen, cured, or canned form."

FOREIGN TRADE:

"Commerce Leads Way--Trade Expansion Act of 1962 is Law," by Luther H. Hodges; "Trade Act Details," by Harold T. Lamar, articles, *International Commerce*, vol. 68, no. 19, October 22, 1962, pp. 2-6, printed, single copy 35 cents. U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the impact of the Trade Expansion Act of 1962 on the United States as well as on the international economy and explains details of the Act and how it will operate. The Act was signed into law on October 11, 1962, extending the authority of the President to enter into trade agreements and to modify import restrictions for a period of 5 years ending June 30, 1967. Congress grants to the President adequate authority to deal with the problems and challenges facing the United States in its trading relations with other countries. This will assure expanded export opportunities in the growing markets abroad, which will benefit American industry, agriculture, and labor, according to the authors.

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FRANCE:

"La Peche Industrielle" (Commercial Fishing), by F. Dorville, article, Revue Maritime, No. 183, 1961, pp. 1563-1577, illus., printed in French. Departement des Peches Maritimes, Societe MacGregor-Comarain, Paris, France.

FREEZE-DRYING:

"Accelerated Freeze-Drying of Food," by S.W.F. Hanson, article, New Scientist, no. 304, September 13, 1962, pp. 570-572, illus., printed. New Scientist Cromwell House, Fulwood Place, High Holborn, London WC1, England.

"Freeze-Drying in the Food Industry," by L. Rey, article, Revue Generale du Froid, vol. 39, no. 3, March 1962, pp. 355-360, printed in French. Revue Generale du Froid, Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

"Freeze-Drying: What It Is and What It Costs," by E.P. Mehrlich, article, Canadian Refrigeration and Air-Conditioning Journal, vol. 28, no. 2, February 1962, pp. 14-17, illus., printed. Canadian Refrigeration and Air-Conditioning Journal, National Business Publications Ltd., 137 Wellington St. W., Toronto, Canada.

Optimum Processing Conditions for Freeze-Drying (Paper presented at the 21st Annual Meeting of the Institute of Food Technologists, New York, May 7-11, 1961), by W.R. Smithies (Defence Research Medical Laboratories, Toronto, Canada), printed. Institute of Food Technologists, 510 No. Hickory St., Champaign, Ill. (Abstract in Food Trade Review, vol. 31, no. 6, 1961, p. 56.)

Progres recents en lyophilisation (Recent Advancement in Freeze-Drying), by L. Rey and others, 196 pp., illus., printed in French, NF33 (about US\$6.75). Hermann, 115 Blvd. St. Germain, Paris 6^e, France.

The Stability of Freeze-Dried Foods, by R. M. Ballantyne, T. S. Blakley, and others, Defence Research Medical Labs, rpt. no. 232-11, 10 pp., printed. Defence Research Board, Medical Research Section, 125 Elgin St., Ottawa, Canada, February 1962. Results of organoleptic tests on stored freeze-dried raw meats, cooked meats, fish, vegetables, and fruits are given. An estimate is given of the storage life of a variety of products.

FREEZING:

"Freezing and Cold Storage," article, Torry Research Station, Annual Report 1960, pp. 18-19, printed. Torry Research Station, Aberdeen, Scotland, 1961.

"The Freezing of Crustacea," by J. Deniel, article, Revue Generale du Froid, vol. 39, no. 1, January 1962, pp. 33-37, illus., printed in French. Revue Generale du Froid, Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris VI, France.

"Uber das Gefrieren von seefischen" (On the Freezing of Salt Water Fish), by J. Gutschmidt, article, Kaltetechnik, vol. 13, no. 6, June 1961, pp. 216-225, illus., printed in German. Kaltetechnik, C.F. Muller Verlag, Karlsruhe, Germany.

FROZEN FISH:

"Freezing and Cold Storage: Quality of Frozen, Packaged Fish in Shops," article, Torry Research Station, Annual Report 1960, pp. 20-21, printed. Torry Research Station, Aberdeen, Scotland, 1961.

"Protein Denaturation in Frozen Fish. Cold Storage Studies on Cod Using the Cell Fragility Method," by R.M. Love, article, Journal of the Science of Food and Agriculture, vol. 13, no. 5, May 1962, pp. 269-278, illus., printed. Journal of the Science of Food and Agriculture, The Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

"Reducing Moisture Loss from Frozen Meat and Fish," by Thomas Reid Anderson, article, Chemical Abstracts, vol. 55, December 11, 1961, 26307c, printed. The American Chemical Society, 1155 16th St. NW, Washington, D. C.

GEAR:

"A Note on the Night Fishing Observations from a 'Kelong,'" by E.D. Chelappa, article, Journal of the Marine Biological Association of India, vol. 1, no. 1, 1959, pp. 93-94, printed. Central Marine Fisheries Research Institute, Marine Fisheries (P.O.), Madras, India.

"Le Rolling-bowl dispositif de levage pour bolinche ou filets tournants" (The "Rolling-Bowl," a Hauling Gear for Seine Nets), article, Peche Maritime, vol. 40, no. 1001, 1961, pp. 592-593, illus., printed in French. Peche Maritime, 190, Boulevard Haussmann, Paris, France.

"Ovyborie ratzional'noy formy tralovoy doski" (Choosing Rational Shape of Otter Boards), by I.R. Matrosov, article, Rybnoe Khoziaistvo, vol. 34, no. 1, 1958, pp. 36-42, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

GERMAN FEDERAL REPUBLIC:

Jahresbericht über die Deutsche Fischwirtschaft, 1961/62 (Annual Report on German Fisheries, 1961/62), issued by the Ministry of Food, Agriculture, and Forestry in cooperation with the Federal Statistical Office, 316 pp., illus., printed in German with English table of contents and summaries, DM 25 (about US\$6.25). (Available from Gebr. Mann, Hauptstrasse 26, Berlin 62, Germany, 1962.) A review covering all phases of the German fisheries in 1961/62. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply, the German fishing fleet, biological-statistical report on the German deep-sea fishery, and foreign trade in fishery products. Part II includes information on cruises of the fishery protection and fishery research vessels, the fishing industry and the Seamen's Vocational Association, work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part III presents data on the German deep-sea fishery in 1961, the lugger herring fishery, the cutter deep-sea and coastal fisheries, fresh-water fisheries, processing of fish and shellfish, publicity campaign, and promotion of fish marketing. Part IV gives data on foreign fisheries and whaling.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

HORSE MACKEREL:

La Caballa del Mar Argentino, I--Sistematica, Distribucion y Pesca (The Horse Mackerel of the Argentine Sea. I--Description, Distribution, and Fishery), by Rogelio B. Lopez, 38 pp., illus., printed in Spanish. (Reprinted from Comunicaciones del Museo Argentino de Ciencias Naturales BERNARDINO RIVADAVIA e Instituto Nacional de Investigacion de las Ciencias Naturales, Ciencias Zoologicas, vol. 3, no. 3, 1959, pp. 95-130.) Ministerio de Educacion de la Nacion, Direccion General de Cultura, Buenos Aires, Argentina.

ICELAND:

Fjarmalatidindi, no. 3, August-December 1962, 247 pp., illus., printed in Icelandic. Fjarmalatidindi, Lansbauka Islands, Reykjavik, Iceland. Includes, among others, statistical tables giving data on production of fishery products.

INTERNATIONAL COMMISSIONS:

International North Pacific Fisheries Commission, Bulletin No. 8, 113 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B.C., Canada, 1962. Includes articles on "Intraspecific Differences in Serum Antigens of Red Salmon Demonstrated by Immunochemical Methods," by George J. Ridgway, George W. Klontz, and Charles Matsumoto; and "Continental Origin of Red Salmon as Determined from Morphological Characters," by Francis M. Fukuhara and others.

(International North Pacific Fisheries Commission) The Exploitation, Scientific Investigation and Management of Salmon (Genus ONCORHYNCHUS) Stocks on the Pacific Coast of Canada in Relation to the Abstention Provisions of the North Pacific Fisheries Convention, Bulletin No. 9, 120 pp., illus., printed. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B.C., Canada, 1962. Under the provisions of the International Convention for the High Seas Fisheries of the North Pacific Ocean, Japan and, in one instance, Canada agree to abstain from fishing Pacific salmon (genus Oncorhynchus) in portions of the Convention area off the coasts of Canada and the United States. The Commission is required to study the stocks of fish under abstention for the purpose of determining annually whether such stocks continue to qualify for abstention. The purpose of the papers contained in this bulletin was to provide information which would aid the Commission to carry out the above duty, that is to determine annually, beginning in 1958, whether the salmon stocks originating in the rivers of Canada continued to meet the requirements for abstention given in the Convention.

INTERNATIONAL FISHERIES CONVENTION:

International Fisheries Convention of 1946. The Permanent Commission, Report by the President on the Tenth Meeting, 29 pp., processed in French and English. Office of the Permanent Commission, Rm. 617, East Block, Whitehall Pl., London SW1, England, 1962. Includes a report by the President on the Tenth Meeting of the Permanent Commission, held in Hamburg, May 1962; a list of names and descriptions of delegates, advisors, and observers attending the meeting; and the agenda. Also presents a report by the

Finance Committee in regard to the financial year ended June 30, 1961, and estimate of payments and receipts for the year ending June 30, 1962; provisional budget for the year ending June 30, 1963; and a press notice issued after the Tenth Meeting.

IRRADIATION PRESERVATION:

"Progress in Food Irradiation," by M. Ingram and D. N. Rhodes (Low Temperature Research Station, Cambridge, England), article, Food Manufacture, vol. 37, July 1962, pp. 318-320, 323-326, printed. Leonard Hill Ltd., 9 Eden St., London NW1, England.

ISRAEL:

Bamidgah (Bulletin of Fish Culture in Israel), vol. 14, no. 3, September 1962, 42 pp., illus., printed in Hebrew and English. Fisheries Division and Fish Breeders' Association, Nir-David, D. N., Hakirya, Israel. Contains, among others, articles on: "An Exposition of the Terms 'Pond Productivity' and 'Carrying Capacity' of Ponds," by S. Tal; and "Primary Production in Fishponds and Its Application to Fertilization Experiments," by B. Hepher.

JAPAN:

Japan's Licensing and Exchange Controls, by Tatsuo A. Miyakawa, OBR-62-6, 4 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Presents information on Japan's import and export controls and United States controls on exports and imports.

Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 11, no. 1, September 1962, 109 pp., illus., printed in Japanese with English abstracts. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Includes, among others, these articles: "Studies on the Catch Efficiency Derived from the Difference in the Construction of Tuna Long-Line Gear. III--On the Results of the Test Operations by the Long-Line Gear with 2-5 Hooks," by Tomokazu Morita and Nobuo Higo; "Notes on Some Marine Algae from Viet-Nam. I" (in English), by Takesi Tanaka and Pham-Hoang Ho; "On the Deterioration of Frozen Fishes during Storage," by Junichi Nishimoto; and "Studies on the Tannage of Fish Skin," by Michitoshi Ochi.

KING CRABS:

Loss of Isthmus Tags from King Crabs (PARALITHODES CAMTSCHATICA (Tilesius)) (Final Report), by George W. Gray, Jr., Informational Leaflet No. 22, 5 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska. Discusses the discrepancies in percentages of tag losses found by various observers. An experiment was conducted in which tagged king crab were retained in a tank of sea water, fed, and observed for tag losses. Findings showed that with proper methods and materials the loss of isthmus tags immediately prior to molting is negligible.

KOREA:

Agriculture Year Book, 1962, 512 pp., illus., printed in Korean with English tables. The National Agricultural Co-Operatives Federation, Seoul, Korea. Includes,

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among others, statistical tables on tonnage of fishing vessels, production of marine products, fishery population, products of aquatic culture, processed marine products, and foreign trade in marine products.

LIPID DEPRESSANT:

"The Lipid Depressant Activities of Whole Fish and Their Component Oils," by James J. Peifer, F. Janssen, R. Muesing, and W. O. Lundberg (The Hormel Institute, University of Minnesota, Austin), article, *Journal of the American Oil Chemists' Society*, vol. 39, June 1962, pp. 292-295, printed. American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

LOBSTERS:

"Control of Blackening of Lobster," by Michinori Yamaga and others (Taiyo Fishery Co., Shimonoseki, Japan), article, *Chemical Abstracts*, vol. 56, April 2, 1962, 7758e, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C.

The Food of the Norway Lobster, *NEPHROPS NORVEGICUS* (L.), by H. J. Thomas and C. Davidson, *Marine Research* 1962, No. 3, printed, \$1.10. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., April 1962.

LOUISIANA:

"A Study of the Fauna of the Offshore Waters in Louisiana," by C. E. Dawson, article, *Proceedings of the First National Coastal and Shallow Water Research Conference*, October 1961, pp. 445-446, printed. Gulf Coast Research Laboratory, Ocean Springs, Miss.

LUMINESCENCE:

"Comparative Studies of Luminescence in Copepods and Other Pelagic Marine Animals," by G. L. Clarke and others, article, *Journal of the Marine Biological Association of the United Kingdom*, vol. 42, no. 3, October 1962, pp. 541-564, illus., printed, 70s. (about US\$13). Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

MALAGASY REPUBLIC:

"Evolution de la Pisciculture et de la Peche dans les eaux interieures de Madagascar depuis 1950" (Development of Fish Culture and the Inland Waters Fishery of Madagascar since 1950), by A. Kiener, article, *Bulletin de Madagascar*, vol. 12, no. 199, December 1962, pp. 1033-1044, illus., printed in French. *Bulletin de Madagascar*, M. le Directeur de l'Imprimerie nationale, Tananarive, Malagasy Republic.

MALAYA FEDERATION:

"Weight Increase in Toddler Children in the Federation of Malaya: A Comparison of Dietary Supplements of Skim Milk and Fish Biscuits," by Florence A. Thomson and Elizabeth Merry (Institute for Medical Research, Kuala Lumpur, Federation of Malaya), article, *British Journal of Nutrition*, vol. 16, no. 2, 1962, pp. 175-183, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

MEXICO:

Economic Developments in Mexico, 1961, by Katherine E. Rice, WTIS Part 1, Economic Report No. 62-79, 16 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Includes a review of 1961, relations between Mexico and the United States and between Mexico and other countries, finance, changes in tariffs and trade controls, economic development program, and investment climate. Also covers economic trends, manufacturing and extractive industries, electric power, agricultural production and distribution, and farm programs. A section on fisheries discusses shrimp landings and exports, total value of fishery products exports and imports, edible fishery products landings, and the more important commercial species.

MISSISSIPPI:

"Report on the Gulf Coast Research Laboratory, 1955-1960," by G. Gunter, article, *Journal of the Mississippi Academy of Science*, vol. 7, 1961, pp. 22-28, printed. Gulf Coast Research Laboratory, Ocean Springs, Miss.

MOLLUSKS:

Shells of the New York City Area: A Handbook of the Land, Fresh Water and Marine Mollusks Ranging from Cape Cod to Cape May, by Morris K. Jacobson and William K. Emerson, 142 pp., illus., printed. Argonaut Books, Larchmont, N. Y., 1961.

NETS:

How to Make and Set Nets; or, the Technology of Netting, by John Garner, 103 pp., illus., printed. Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England, 1962. A valuable reference for both the net maker and the fisherman who uses and operates the nets. The earlier chapters explain the basic technology of preparing the looms in order to make and shape the various nets with maximum efficiency and economy. The later chapters deal with the specific nets used by fishermen and give an understanding of the principles of operation and rigging by which they give best results. Discusses in detail, with the aid of many sketches, mesh size, net-making machines, loom planning, shaping netting, and hanging netting. Further discussions cover seine net patterns, trawls, pound nets, and surround nets. A dictionary of fishing gear and terminology is included.

"Prüfmethoden für Netzgarne und Netztüche" (Testing Methods for Net Twine and Webbing), by A. von Brandt, article, *Protokolle zur Fischereitechnik*, vol. 30, no. 7, 1960, 92 pp., illus., printed in German. Institut für Netz- und Materialforschung, Bundesforschungsganstalt für Fischerei, Palmallee 9, Hamburg-Altona 1; Germany.

NEW CALEDONIA:

"Thriving Fishermen's Co-Operative in Noumea," by Raymond Cassier, article, *South Pacific Bulletin*, vol. 12, no. 4, October 1962, pp. 29, 56, illus., printed.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

single copy 30 cents. South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. Established in mid-1960, the Fishermen's Co-Operative of Noumea has shown steady progress. In the first year, 48 tons of fish were sold, and production was doubled within 12 months. The Co-Operative receives the catch from the fishermen, deep-freezes it, and sells it on the Noumea market, either wholesale or retail. Assets include a freezing plant and 100-foot wharf.

NEW ENGLAND:

Terrestrial and Marine Mammals of Massachusetts and Other New England States, by Joseph H. Waters C. Jean-Jacques Rivard, 157 pp., illus., printed. Standard-Modern Print Co., Brockton Mass., 1962.

NIGERIA:

Report on the Fisheries of Nigeria, by A. R. Longhurst, 53 pp., printed. Federal Fisheries Service, Ministry of Economic Development, Lagos, Nigeria, 1962. Summarizes the fisheries situation in Nigeria and its future requirements. Only about one-fourth of Nigeria's fisheries products supplies are produced locally. The author believes that the best prospects for increasing production lie in the exploitation of distant-water fisheries, both pelagic (especially the tunas) and demersal. There is an account of the fresh-water fisheries, indicating scope for expansion in the potentially rich fisheries of Lake Chad. Research work conducted by the Federal Fisheries Service is described, including surveys made by the 70-foot research vessel, a study of the life histories of the most important species, and studies of mesh-selection and the fishing effort.

OCEANOGRAPHY:

Fisheries Hydrography. How Oceanography and Meteorology Can and Do Serve Fisheries, by Ilmo Heila and Taivo Laevastu, 137 pp., illus., printed. Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England, 1961.

Fishes and Fish Larvae Collected from Atlantic Plankton Cruises of R. V. "Pathfinder," 1961/62, by William Henry Massmann, Special Scientific Report No. 33, no. 1, printed. Virginia Fisheries Laboratory, Gloucester Point, Va., 1962.

The Johns Hopkins Oceanographic Studies, No. 1, 68 pp., illus., printed. Johns Hopkins Press, Homewood, Baltimore 18, Md., 1962.

Journal du Conseil, vol. 27, no. 3, November 1962, pp. 219-335, illus., printed, single copy Kr. 16 (about US\$2.32). Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. (Available from Messrs. Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark.) Includes, among others, articles on: "The Effect of Tidal Streams on the Presence of an Extensive Layer of Midwater Echo Traces," by V. Valdes and D. H. Cushing; "Asdic as an Aid to Spawning Ground Investigations," by A. R. Stubbs and R. G. G. Lawrie; Measurement of the Dimensions of Fish to Facilitate Calculations of Echo-Strength in Acoustic Fish Detection," by R. W. G. Haslett; "The Correlation Table Analysis of a Sprat (*Clupea sprattus* L.) Year-Class to Separate Two Groups Differing in Growth

Characteristics," by T. D. Iles and P. O. Johnson; "The Use of the Scales of the Brown Trout (*Salmo trutta* L.) for the Back-Calculation of Growth," by Charlotte Kipling; "Some Observations on the Whiting (*Gadus merlangus* L.) of the Inshore Winter Fishery Off Lowestoft," by D. W. R. Rout; and "Transatlantic Migration of Two Large Bluefin Tuna," by Frank J. Mather III.

The Ocean, by Francis Downes Ommanney, No. 203, 244 pp., illus., printed, \$1.75. The Home University Library of Modern Knowledge, Oxford University, Amen House, Warwick Sq., London EC4, England, 1961.

Proceedings of the First National Coastal and Shallow Water Research Conference, October 1961, Baltimore, Maryland, Los Angeles, California, Tallahassee, Florida (Sponsored by The National Science Foundation and The Office of Naval Research), edited by D. S. Gorsline, 900 pp., illus., processed. Acting Director, Oceanographic Institute, Florida State University, Tallahassee, Fla., February 1962. Contains programs of the meetings held at Baltimore, Los Angeles, and Tallahassee, and abstracts of papers presented. Also includes the texts of all papers presented by American as well as foreign scientists.

OYSTERS:

Useful Publications for Oyster Farmers of the Maritimes, by J. C. Medcof, General Series Circular No. 32, October 1958, 3 pp., printed. Fisheries Research Board of Canada Biological Station, St. Andrews, N. B., Canada.

PAKISTAN:

Establishing a Business in Pakistan, by George S. Ayres, WTIS Part 1, Economic Report No. 62-44, 24 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A report summarizing the major legal requirements for establishing a business and investing in Pakistan. Outlines the pertinent sections of Pakistan's laws, regulations, and policies affecting the establishment and operation of business enterprises in Pakistan by foreign nationals. Attention also has been given to the factors governing foreign participation in joint ventures with Pakistani nationals. Covers Government policy on investments, entry and repatriation of capital, trade factors affecting investment, and business organization. Also discusses patents, copyrights, and trademarks; regulations affecting employment; taxation; avoidance of double taxation; and miscellaneous overhead costs.

Pakistan's Licensing and Exchange Controls, by George S. Ayres, OBR-62-5, 8 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Contains information on Pakistan's import policy--licensing controls, and exchange controls; Pakistan's export controls--administration and extent, and promotion plan; and United States controls on exports and imports, and other related topics.

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PERU:

Establishing a Business in Peru, by R. F. Rodriguez, WTIS Part I, Economic Report No. 62-78, 32 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., October 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses in detail investment outlook, business organizations, business record, organization costs, taxation, labor legislation, and other related subjects.

PILCHARDS:

The Pilchard of South West Africa (SARDINOPS OCELLATA), General Hydrography of the Waters Off Walvis Bay, South West Africa, 1957-1958, by G. H. Stander, Investigational Report No. 5, 61 pp., illus., printed. Administration of South West Africa, Marine Research Laboratory, Windhoek, South West Africa, 1962. Figures for temperature, salinity, and sigma-T are considered on a monthly and a seasonal basis. The data obtained in respect to the dissolved inorganic phosphorus in the upper 50 meters of the sea are discussed. Brief reference is made to wind data collected at Pelican Point.

PORUGAL:

"La industria portuguesa de conservas de pescado y los problemas de su reorganizacion" (The Portuguese Canned Fish Industry and Problems of Its Reorganization), by Mario de Sousa, article, Industria Conservera, vol. 28, no. 280, October 1962, pp. 253-254, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain.

PROTEIN:

"Post-mortem changes in Fish Tissues: Endogenous Proteinases in Codfish and Rockfish Kidney and Protein Degradation in Rockfish Skeletal Muscle," by Chesley M. Blackwood (University of Washington, Seattle), article, Chemical Abstracts, vol. 57, August 6, 1962, 3892b, printed. The American Chemical Society, 1155 16th St. NW, Washington, D. C.

PURSE SEINING:

"Lov na svet koshel kovym nevodom s motodori" (Purse Seining with Lights from a Motorized Dory), by V. M. Kirillov, article, Rybnoe Khoziaistvo, vol. 37, no. 1, 1961, pp. 27-31, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekt, pri Gosplanie SSSR, Moscow, U.S.S.R.

"New Method of Purse Seining," by I. I. Kul'batskii, Rybnoe Khoziaistvo, vol. 36, 1960, pp. 46-48, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekt pri Gosplanie SSSR, Moscow, U.S.S.R.

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Radiation Preservation of Food, PB 151 493, 461 pp., printed, \$5. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., August 1957.

REFRIGERATED WAREHOUSES:

"Air Doors for Refrigerated Warehouses--a Review," article, Information Bulletin, The Refrigeration Research Foundation, No. 61-11, 1961, pp. 2-3, illus., printed. The Refrigeration Research Foundation, 12 N. Meade Ave., Colorado Springs, Colo.

REFRIGERATION:

"Problems and Progress in Retaining Fish Quality by Refrigeration--Paper 1," by Charles L. Cutting (British Food Manufacturing Industries Research Association, Randalls Road, Leatherhead, Surrey, England), article, Modern Refrigeration, vol. 65, May 1962, pp. 448-451, printed. Refrigeration Press Ltd., Maclarens House, 131 Great Suffolk St., London SE1, England.

"Refrigeration and Fish: Recent Developments in Cooling and Freezing," by J. R. Crepey, article, Genie Rural, vol. 55, no. 4, April 1962, pp. 203-205, 231, illus., printed in French. J. H. LaGrange, 39 Rue du General Foy, Paris 8e, France.

SALMON:

Salmon Forecast Studies on 1963 Runs in Prince William Sound, by Wallace A. Noerenberg, Information Leaflet No. 21, 30 pp., illus., processed. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska, January 1, 1963. Discusses the value of salmon run forecasts to industry; methods used in obtaining data; and approximate numbers of pink, chum, and red salmon expected in the 1963 run. Also includes a number of detailed statistical tables and graphs giving data on commercial catches of salmon, 1920-61; escapement-return ratios; live counts of salmon in various areas; and other similar data.

SALT FISH:

Quantitative Characteristics of Fish after Salting, by L. P. Levandov, Israel Program for Scientific Translations, PST Cat. No. 109, pp. 39-45, processed. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1960.

"Studies on Dry-Salting and Sundrying of Mackerel (Rastrelliger kanagurta Cuv.); "Effect of Chlorotetracycline, Sorbic Acid, Sodium Propionate, Sodium Benzoate and Sodium Acid Phosphate on the Keeping Quality of Sun-Dried Salted Mackerel;" and "Effect of Varying Proportions of Salt to Fish on the Quality of Sun-Dried Mackerel," by D. P. Sen, K. Visweswaran, and N. L. Lahiry, articles, Food Science, vol. 10, 1961, pp. 123-131, 132-138, and 139-143, respectively, illus., printed. Central Food Technological Research Institute, Mysore, India.

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SHARKS:

"*Cetorhinus*" en Atlántico Sur. (*Elasmobranchii: Cetorhinidae*) (*Cetorhinus in the South Atlantic-Elasmobranchii: Cetorhinidae*), by Elvira M. Sicardi, 43 pp., illus., printed in Spanish with English summary. (Reprinted from *Revista del Museo Argentino de Ciencias Naturales BERNARDINO RIVADAVIA e Instituto Nacional de Investigación de las Ciencias Naturales, Ciencias Zoológicas*, vol. 6, no. 2, 1961, pp. 59-101.) Ministerio de Educación de la Nación, Dirección General de Cultura, Buenos Aires, Argentina.

SHRIMP:

"Investigation of the Effect of Packaging Frozen Cooked Shrimp under Vacuum and in an Atmosphere of CO₂," by Olaf Karsti and Dagfinn Hakvg, article, *Reports on Technological Research Concerning Norwegian Fish Industry*, vol. 4, no. 1, 10 pp., printed in Norwegian with summary in English. *Fiskeridirektoratet*, Bergen, Norway, 1961.

"Microbial Analysis of Frozen Raw and Cooked Shrimp. I--General Results," by G. J. Silverman and others, article, *Food Technology*, vol. 15, 1961, pp. 455-458, illus., printed. *Food Technology*, The Garrard Press, 510 No. Hickory, Champaign, Ill.

"On the Qualitative Distribution of Amino Acids in Different Species of Prawns," by N. K. Velancker (Central Fisheries Technological Research Station, Ernakulam, South India) and K. Mahadeva Iyer, article, *Journal of Scientific and Industrial Research*, vol. 20C, no. 2, 1961, pp. 64-65, illus., printed. Council of Scientific and Industrial Research, Old Mill Rd., New Delhi 2, India.

"Studies on the Nutritive Value of Bombay Prawns. II--Chemical Composition and Nutritional Constituents of Penaeid Prawns," by F. S. Shaimkhahud (Department of Biochemistry, Institute of Science, Bombay, India) and N. G. Magar, article, *Journal of Scientific and Industrial Research*, vol. 20D, no. 4, 1961, pp. 157-158, printed. Council of Scientific and Industrial Research, Old Mill Rd., New Delhi 2, India.

"Undersøkelse over effekten av vakuumpakking og lagring i kullsystretnosfaere ved frysing av reker" (Study of the Effect of Vacuum-Packing and Storage in Carbon Dioxide on Frozen Shrimp), by O. Karsti and D. Hakvg, article, *Fiskeridirektoratets Skrifter*, vol. 4, no. 1, 1961, pp. 3-10, illus., printed in Norwegian. *Fiskeridirektoratets Skrifter*, Fiskeridirektoratet, Bergen, Norway.

SMALL BUSINESS MANAGEMENT:

Growth: *Implications for Small Marketers*, by Albert Christopher, *Small Marketers Aid No. 86*, 4 pp., processed. Small Business Administration, Washington 25, D. C., December 1962. A leaflet to help small businessmen in their individual efforts to explore opportunities resulting from the Nation's expansion. At least six trends are on the increase in the country's growth. They are population, urban areas, productivity, automation, income, and leisure. Although growth is uneven and varies with localities, these trends are resulting in conditions that can help small marketers. The leaflet suggests ways by which the small retailer, wholesaler, or service operator can keep aware of the Nation's growth and its affects on his business.

SMOKING:

"Smoking of Foods. III--Mechanism of Smoking," by P. Spanyar (Central Research Institute of Food Industries, Budapest, Hungary) and E. Kevai, article, *Zeitschrift für Lebensmittel-Untersuchung und -Forschung*, vol. 115, 1961, pp. 1-9, printed in German. *Zeitschrift für Lebensmittel-Untersuchung und -Forschung*, Springer Verlag, 3 Heidelberger Platz, Wilmersdorf, Berlin, Germany.

SOUTH AFRICA REPUBLIC:

The South African Fishing Industry Handbook and Buyers' Guide, 1962/63, 251 pp., illus., printed, R4.20 (about US\$5.90). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, South Africa Republic, 1962. The sixth edition of this handbook reviews the progress of the South African and South-West African fishing industry during 1961 and 1962 and gives details of the catch and production of fishery products. Included is information on recent developments in the fishing industry; fish-processing factories; fish meal industry; South African fish species; legal minimum size limits of South African fish; and organizations serving the industry. Also covers leading personalities in the industry; South and South-West African fishing companies; fishery products; buyers' guide; details of vessels; motor fishing boats; motor and steam trawlers; details of marine engines; and suppliers of fuels and lubricants.

SOUTHEAST ASIAN WATERS:

Physical Oceanography of the Southeast Asian Waters, NAGA Report Vol. 2--Scientific Results of Marine Investigations of the South China Sea and the Gulf of Thailand, 1959-61, by Klaus Wyrtki, printed. Scripps Institute of Oceanography, La Jolla, Calif., 1961.

SOUTHEAST PACIFIC:

"Research on Marine Resources in Chile, Ecuador and Peru," by Robert Clarke (National Institute of Oceanography, England), article, *Fishing News International*, vol. 1, no. 5, October 1962, pp. 44-50, illus., printed, single copy 6s. 6d. (about 91 U.S. cents). *Fishing News International*, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Discusses the ocean currents along the Pacific Coast of South America and their relation to marine life; known marine resources such as the anchoveta, centolla, shrimp, tuna, whales, and seals; and present exploitation--fishing, guano harvesting, fishing methods, and whaling. Also covers future research and development, earlier research work, United Nations Special Fund fishery projects, and Ecuadorean and Peruvian research plans.

SPAIN:

"Las exportaciones de conservas de pescado gallegas en 1961" (Galician Exports of Canned Fish in 1961), by Manuel Ordax Ordax, article, *Industria Conservera*, vol. 28, no. 279, September 1962, pp. 222-224, 225, printed in Spanish. *Industria Conservera*, Calle Marques de Valladares, 41, Vigo, Spain.

"La exportación española de productos pesqueros. III--La exportación de conservas de pescados y mariscos" (Spanish Export of Fishery Products. III--Export of Canned Fish and Shellfish), by V. Paz-Andrade, article, *Industrias Pesqueras*, vol. 36, no. 853, November 1962, pp. 370-372, printed in Spanish, single

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copy 10 ptas. (about 17 U. S. cents). Industrias Pesceras, Policarpio Sanz, 21-20, Vigo, Spain.

SPINY LOBSTERS:

Le rôle prépondérant des pêcheurs Cornouaillais dans la Recherche et l'Exploitation de nouveaux Fonds langoustiers (The Leading Role of the Fishermen of Cornouaillais in the Search and Exploitation of New Spiny Lobster Grounds), by E. Postel, 14 pp., illus., printed in French. (Reprinted from Penn Ar Bed, vol. 3, March 1962, pp. 141-152.) Office de la Recherche Scientifique et Technique Outre-Mer, Service Central de Documentation, 80, route d'Aulnay, Bondy (Seine), France.

SPONGES:

"Sponge Profits in a Squeeze," article, Chemical Week, vol. 91, no. 17, October 27, 1962, pp. 43-44, 46, 50, 55, illus., printed, single copy 50 cents. Chemical Week, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36, N. Y. Four different kinds of sponges are currently on U. S. markets: the natural sea-sponge, which is a marine animal's skeleton (generally, Phylum porifera), and three synthetics: cellulose, vinyl, and urethane. Natural sponges are harvested by local fishermen both in the Mediterranean and the Gulf of Mexico. In 1939 a severe sea blight off the Florida Keys decimated the U. S. crop--sending the synthetics into their first spurt of popularity. While the synthetics are most popular in household uses, natural sponges have greatest use by painters, janitors, artists, window-washers, and in industrial applications (printing, cleaning, painting, ceramics).

SQUID:

"Squid Tropomyosins," by Shuichiro Kubo, article, Memoirs of the Faculty of Fisheries Hokkaido University, vol. 9, no. 1, 1961, pp. 57-83, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

TAIWAN:

"Model Fishery Development in Taiwan," by E. Stuart Kirby, article, Fishing News International, vol. 1, no. 5, October 1962, pp. 16-20, illus., printed, single copy 6s. 6d. (about 91 U. S. cents). Fishing News International, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Covers the fishery resources of Taiwan, fisheries administration and research, vocational and professional fisheries education, and fishermen's associations. Also discusses the types of fisheries--deep-sea, inshore, coastal, and fresh-water; fish processing; and marketing of fishery products.

Taiwan Fisheries, 1962, 59 pp., printed in Chinese and English. Taiwan Fisheries Bureau, Provincial Government of Taiwan, 1688 Chung Cheng Rd., Taipei, Taiwan. Covers in detail the four types of fisheries--deep-sea, inshore, coastal, and fish culture; fisheries production and value since 1931; fishing craft; fishing population and fishermen's associations; and harbors and fish production areas. Also discusses species of commercial importance; fish marketing and transportation; ice making, cold storage, and freezing; processing; education, training, and research; and foreign trade. Includes statistical tables on annual fisheries production, 1949-61, status of fishing craft, fishing population,

production by species, and foreign trade in fishery products.

TARPON:

"The Biology of the Tarpon, Megalops atlanticus, and the Ox-Eye, Megalops cyprinoides, with Emphasis on Larval Development," by Richard A. Wade, Contribution No. 424, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 12, no. 4, December 1962, pp. 545-622, illus., printed, single copy \$2. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Virginia Key, Miami 49, Fla.

TAX GUIDE:

Tax Guide for Small Business, 1963 Edition, 143 pp., illus., printed, 40 cents. Internal Revenue Service, U. S. Treasury Department, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A handbook to assist individuals as well as firms in coping with their tax problems. The new tax guide answers most questions which arise in connection with starting, operating, or selling a business. Practical explanations and examples are provided to show how the Federal income, excise, social security, and withholding taxes apply to proprietorships, partnerships, and corporations. A tax calendar provides the dates for filing returns, paying taxes, and carrying out other operations under the Federal tax laws during 1963. A check list is helpful to the inexperienced in telling him what taxes he may be liable for and what forms he may be required to file. Also covered are the new rules under the Revenue Act of 1962, such as tax credit for investment in newly acquired equipment, extent to which expenses for business travel and entertainment may be deducted, and requirements for filing information returns for payments of dividends and interest.

TRADE LIST:

The U. S. Department of Commerce has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., or from Department of Commerce field offices at \$1 each.

Oils (Animal, Fish and Vegetable)--Importers, Dealers, Producers, Refiners, and Exporters, Republic of South Africa, 25 pp., processed (November 1962). Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish and whale oils.

TRAWLERS:

"Bulb-Trawlers," by D. J. Doust, article, Ship and Boat Builder, vol. 14, no. 6, 1961, pp. 40-42, illus., printed. Ship and Boat Builder, John Trundell Ltd., St. Richards House, Eversholt St., London NW1, England.

TRAWLING:

"O raznoglubinnom love seldi v Severnoi Atlantike" (On Midwater Trawling for Herring in the North Atlantic), by E. V. Kamenskii and V. R. Trebuschnoi, article, Rybnoe Khoziaistvo, vol. 36, no. 11, 1960, pp. 42-49, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

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TRAWLS:

"Mechanical Analysis on the Working Behavior of Midwater Trawl," by Otohiko Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, October 1961, pp. 903-907, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

TROUT:

"Fecondite et Croissance de la Truite (Salvelinus fontinalis) dans Trois Lacs du Parc des Laurentides" (Fertility and Growth of the Trout--Salvelinus fontinalis--in Three Lakes of Laurentides Park), by Yves Desmarais, article, Le Naturaliste Canadien, vol. 86, no. 2, February 1959, pp. 31-45, printed in French. Le Naturaliste Canadien, l'Université Laval, Quebec, Canada.

The Lake Trout--Its Life History, Ecology, and Management, by Russell Daly, Vernon A. Hacker, and Lawrence Wiegert, Publication No. 233, 15 pp., illus., printed. Wisconsin Conservation Department, Madison 1, Wis., 1962. Covers the classification, distribution, and description of the lake trout. Also describes its habits and habitat, reproduction, population size and mortality rates, and ecology. Angling and commercial fishing for lake trout, its economic value, and management are also described.

TUNA:

"Horizontal Distribution of Catch by the Longline," by Nobuo Hirayama, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, November 1961, pp. 987-989, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

"Studies on the Tuna Longline Fishery in the Eastern China Sea and Okinawa Region. I--Fish Composition," by Ichiro Furukawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 27, June 1961, pp. 558-565, printed. Japanese Society of Scientific Fisheries, 6-chome, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

UNITED KINGDOM:

Annual Abstract of Statistics, 1962, No. 99, 334 pp., printed, £1 2s. 6d. (about US\$3.15). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, 1962. Includes, among others, statistical tables giving data on the value and volume of fishery products landings and the composition of the British fishing fleet.

Licensing and Exchange Controls in the United Kingdom, by Thomas Brian Ketchum, OBR-62-1, 4 pp., printed, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C., November 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses import and export controls of the United Kingdom and United States controls on imports from and exports to that country.

USE OF EXPLOSIVES:

"Seismic Splash," by William L. Craig, article, Outdoor California, vol. 23, no. 9, Sept.-Oct. 1962, pp. 18-20, illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento, Calif. The

use of explosives in the waters of California can be harmful to fish life. The author tells how the Department of Fish and Game and the Fish and Game Commission regulate the use of explosives in California to keep this loss to a minimum.

U.S.S.R.

"Fishing Craft of the USSR," by Alexander Gorinov, article, Fishing News International, vol. 1, no. 5, October 1962, pp. 80-82, illus., printed, single copy 6s. 6d. (about 91 U. S. cents). Fishing News International, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. The seven-year economic development plan of the Soviet Union (1959-65) provides for increasing the catch of fish, sea animals, and sea products from 2,900 million kilograms in 1958 to 4,640 million kilograms in 1965. New ships are being built and under the seven-year plan the fishing fleet will get more than 14,000 vessels. This article discusses the specifications and operations of some new floating factoryships, stern ramp trawlers, medium trawlers, motherships, and whaling vessels.

Freshwater Fishes of the U.S.S.R. and Adjacent Countries, by Leo S. Berg, Vol. 1, OTS 61-31218, 511 pp., illus., printed, \$5. (Translated from the Russian, Ryby presnykh vod SSSR i sopredel'nykh stran) Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., 1962. Descriptions are given of all the fresh-water fish (including commercially-valuable species) of the Arctic Sea basins in Europe and Asia, the Pacific Ocean basin from the Bering Sea to the Tumen'-Ula River (on the Korean border), the basins of Lake Balkhash and the Aral Sea, the rivers of Turkmenistan, and the Black and Baltic Sea basins. Only some western European whitefish are excluded. The book can thus be used as a key for the identification of the fresh-water fish of almost all of Europe (except the Mediterranean countries) and North Asia, and covers an area larger than all of North America. Also included are descriptions of all the fish of the Caspian Sea, including those which do not enter fresh water.

Trudy naucno-issledovatel'skogo instituta mehanizacii rybnoj promysleennosti VNIRO (Studies of the Scientific Research Institute of Mechanization of the Fishery Industry--VNIRO), 144 pp., illus., printed, 60k. (about 70 U. S. cents). Four Continent Book Corp., 156 5th Ave., New York 10, N. Y.

"Utilization of Fish in the Soviet Union," by N. Voskresensky (Department of Technical Science, All-Union Institute of Scientific Research for Fisheries and Oceanography, Moscow, U.S.S.R.), article, Fishing News International, vol. 1, no. 5, October 1962, pp. 9-13, illus., printed, single copy 6s. 6d. (about 91 U. S. cents). Fishing News International, Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Discusses the history and expansion of the Russian fishing industry, long-term plans for development, chilling and freezing of fish, methods of preparing canned fish, types of salted fish, production of caviar, and electrical smoking. According to the author, "In the programme adopted at the 22nd Congress of the Communist Party of the Soviet Union, the necessary basis has been laid down for rapid technical progress in the food industry in general and the fishing industry in particular."

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VESSELS:

Merchant Vessels of the United States, 1962 (Including Yachts), 1183 pp., printed \$6.75. Bureau of Customs, U.S. Department of the Treasury, Washington, D. C., 1962. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Covers every American merchant vessel and yacht (including fishing vessels) which had an uncanceled document (register, enrollment and license, or license) on January 1, 1962. The official number, signal and radio-call letters, type of rig, name, tonnage, dimensions, place and date built, name of owner, and home port of every such vessel are provided.

WATER SAMPLER:

"A New Bottom-Water Sampler for Ecologists," by J. W. Murray, article, Journal of the Marine Biological Association of the United Kingdom, vol. 42, no. 3, October 1962, pp. 499-501, illus., printed, 76s. (about US\$13). Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

WHALES:

"Aerial Photographs Show Sperm Whales' Interesting Habits," by Masaharu Nishiwaki, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 51, no. 10, October 1962, pp. 395-398, illus., printed, Norsk Hvalfangst-Tidende, Hvalfangsforeningen, Sandefjord, Norway.

"Whale of a Rendering Tale," article, National Provisioner, vol. 147, July 14, 1962, pp. 24-26, printed. National Provisioner Inc., 15 West Huron St., Chicago 10, Ill.

WHALING:

"The Tonnages of Whales Taken by Antarctic Pelagic Operations during Twenty Seasons and an Examination of the Blue Whale Unit," by D. T. Crisp, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 51, no. 10, October 1962, pp. 389-393, printed, Norsk Hvalfangst-Tidende, Hvalfangsforeningen, Sandefjord, Norway. The number and tonnages of whales of each species taken by Antarctic pelagic whaling in the years 1932/33 to 1938/39 and 1946/47 to 1958/59 are shown in statistical tables and discussed in detail. The average number of whales taken was about 33,400 per season, but the average tonnage of whales taken per season fell from a pre-war total of about 2 million tons to a post-war total of 1½ million tons. The tonnage of baleen whale material taken each season is compared to the baleen oil production. The results suggest that the total tonnage of raw material in a catch is a useful means of estimating the production potential of that catch. One Blue Whale Unit consists of 80-100 tons of blue, fin or humpback material, but of about 130 tons of sei whale material. It is suggested that a realistic allowance for sei whales would be four individuals, about 87 tons, to one B. W. U.



FLORIDA'S ARTIFICIAL REEFS

Since "fish-drops" or artificial reefs have become productive, they have become more and more popular. There are some 20 established reefs or reefs being built on both coasts of Florida.

Interest in this "make-it-yourself" fishing has become so great that the State has set up rules and procedures for those interested in establishing a reef. After a site is chosen, application is made to the Internal Improvement Fund Trustees who in turn transmit their recommendation to the State Board of Conservation. The Board makes a survey of the proposed site. The Fund Trustees issue a permit if the findings are agreeable. Approval must also be obtained from the U.S. Corps of Engineers.

Latest findings show that a Japanese concrete block 8 feet long, 5 feet wide, and 2½ inches high, with two 15-inch holes on top and bottom and one on each side and one in either end, provide the best substance for artificial reefs. These can be planted about 24 inches apart or can be pyramided. It has been found that these blocks withstand the changing tides as well as storms and that their lasting qualities are better than anything else that has been used to date. Some have been observed in Japan for over 30 years with little signs of deterioration, also some have been in use in the waters of North Carolina for over 10 years. An estimated cost of this block is around \$20. Reports indicate that good sport fishing is found at almost all of the reefs that have been established.

SEA LAMPREYS A GOURMET'S DELIGHT IN SOME PARTS OF THE WORLD

The SEA LAMPREY, reviled generally in North America as an ugly, useless destroyer of other fish, has quite a good reputation in other parts of the world.

As an epicurean delight it is said to have been the unwitting cause of the demise of one monarch, King Henry I of England, who gorged himself to death on them. Later, Henry IV granted protection to ships carrying lampreys for the Royal Consort, and King John so prized them that he once gave a horse in exchange for a single lamprey.

These and other interesting aspects of various people's behavior toward the lamprey, all indicating that "beauty is in the eye of the beholder," formed an interesting report at the annual meeting of the Fisheries Research Board of Canada in 1961.

Most North American interest in the lampreys is generated by the efforts being made to control them in the upper Great Lakes, where they first established a beachhead when the Welland Canal allowed them to circumvent Niagara Falls. They preyed so heavily on lake trout that the latter were almost completely wiped out.

As a table delicacy, however, history as well as present-day gastronomes hold the lamprey in very high esteem. Lampreys, states the report, were formerly used by many North American Indian tribes as food, although some shunned them. During the Nineteenth and Twentieth centuries they were used widely as food by whites as well, particularly by inhabitants of the New England states, among whom it was the custom for families living near a lamprey river to salt down several barrels of lampreys for the winter. Less fortunate families living away from the lamprey rivers considered themselves fortunate when they could exchange a barrel of pork for a barrel of lampreys.

There is a record of one man taking several cartloads of lampreys daily from the St. Lawrence Dam in the Connecticut river in 1847, and around 1880 the going price for lampreys in that district was around five dollars a hundred.

Records of lamprey fisheries in Europe date back to the Romans who are said to have considered them a regal food. Today they are still held in high esteem by many European peoples who prepare them for their own use or carry on a thriving trade in them.

The report indicates that many little Dutch tykes, when not putting their fingers in holes in dikes, had another interesting occupation. Up to 1915 boats fishing out of Holland used to take about 2,000 lampreys aboard to use as bait for catching cod. Also aboard was a boy whose task it was to bite through the head of each lamprey, thus destroying the brain, paralyzing the lampreys, and making them easy to handle. (Canadian Fisherman, February 1962.)

AMERICA'S RARE SEA MAMMALS

Conservation Note 9, America's Rare Sea Mammals, describes how some of America's most interesting wildlife--seals, whales, and sea otters--were saved from extinction.

When America was discovered, many species of sea mammals were abundant in her waters. As early as 1614, whales were being hunted along the New England shores. By 1835, New England whaling vessels were traveling thousands of miles to reach whaling grounds in the North Pacific. At the same time, the sea otter and fur seals were rapidly being decimated along our Pacific coast.

The sea otter was once the world's most valuable fur animal. Formerly it ranged the coasts of the Pacific Ocean from the islands of Japan to Lower California. For 150 years following its discovery in Kamchatka in 1741, the sea otter was hunted relentlessly in American waters. By 1900 it was nearly extinct, remnants persisting in the wildest, most rugged places in the Aleutians and Alaska Peninsula, on the coast of Vancouver Island, and along the California coast. Only 34 skins were recorded for North America in 1910 and the United States Government closed the season on the species. Since 1911, the taking of sea otters in North America has been forbidden by international treaty.



Three adult sea otter and a pup on rocks.

The northern fur seal has also been brought back from near extinction by a protective international treaty and careful land management. Now the rookeries in the Pribilof Islands fairly hum with activity each year in June as wave after wave of fur seals haul out on the beaches. An annual harvest of 60,000 to 70,000 fur seals valued at about \$5 million is taken each year by the United States Government.

Far to the south, along the Mexican and southern California coasts, a close relative of the northern fur seal has not fared so well. Killed by the thousands during the 1880's for its beautiful fur, by 1900 the Guadalupe fur seal was nearly gone from the islands along the California and Mexican coasts. For many years it was thought extinct, but in 1949 and again in 1951, lone bulls were seen near Saint Nicolas Island, California. Then in 1954 a group of 14 fur seals was found on Guadalupe Islands, Mexico. Possibly with careful management and protection the Guadalupe fur seal, too, may survive.

The position of the Hawaiian monk seal is also precarious. Monk seals are the only tropical-water seals in the world. In the 1,000-mile-long chain of islands in the Pacific on which it breeds--from Kure Island to French Frigate Shoals--the Hawaiian monk seal has been so reduced that it does not number more than 1,500 animals. With so few left, biologists fear the species will become extinct. Two factors endanger the monk seal; its extreme tameness and man's encroachment on its breeding islands.

Copies of Conservation Note 9 are available from the Office of Information, U. S. Fish and Wildlife Service, Washington 25, D.C.

The greatest need of the sea otter was protection from man. Protected, they began to increase and slowly spread from island to island in Alaska. Wildlife biologists say there may be 30,000 or 40,000 sea otters in Alaska today.

Very young sea otter pups have been seen in Alaska as early as March and as late as the end of August. The pup nurses until it is about a year old--lying on its mother's chest as she lazily paddles along with her broad hind flippers.

SCALLOPS--A TREAT FOR LENT

Why not serve scallops during Lent as a special treat for your family?

Scallops are marketed all year but are at their best when taken from November through April. Scallops are a light cream color, sometimes varying to a delicate pink. Fresh scallops and frozen scallops when thawed, should have a sweetish odor.

Scallops have a lean, light, firm meat and a sweet flavor. They contain high levels of well-balanced protein, very little fat, and many of the minerals and vitamins necessary for the good health of all members of the family.



Scallops Lorraine.

In the past the most familiar scallop dishes served have been deep-fat fried or pan-fried scallops, however, these dishes are only a beginning since scallops can be served in cocktails, appetizers, soups, salads, and main dishes with equally satisfying results.

The home economists of the Bureau of Commercial Fisheries, United States Department of the Interior, recommend "Scallops Lorraine" as a special treat for the family during Lent.

SCALLOPS LORRAINE

1 pound scallops, fresh or frozen
1 quart boiling water
2 tablespoons salt
1 cup pastry mix
3 eggs, beaten
 $\frac{3}{4}$ cup coffee cream

2 tablespoons sherry
2 tablespoons chopped parsley
1 teaspoon salt
 $\frac{1}{2}$ teaspoon celery salt
Dash pepper
Paprika

Thaw frozen scallops. Remove any shell particles and wash. Place in boiling salted water. Cover and return to the boiling point. Simmer for 3 to 4 minutes, depending on size. Drain. Chop scallops. Prepare pastry mix as directed. Roll and line a 9-inch pie pan. Combine eggs and cream; add remaining ingredients except paprika. Place scallop mixture in pie shell. Sprinkle with paprika. Bake in a moderate oven, 350° F., for 35 to 40 minutes or until pie is firm in the center. Serves 6.

**CALIFORNIA TELEPHONE
CABLE AREA--CAREFUL PLEASE**

The chart shows the telephone cables to be found in the waters off California. To avoid the loss of valuable tackle, cargo, otter boards, nets, or anchor hooks, fishing vessels are urged to not drag nets or drop anchors or other heavy gear near the cable routes shown on the chart.

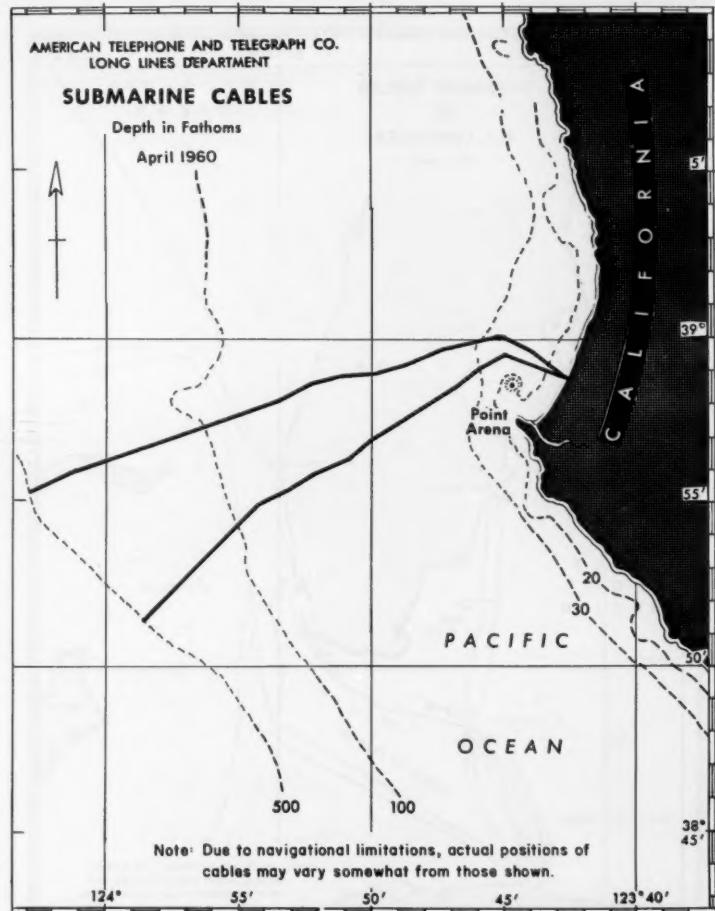
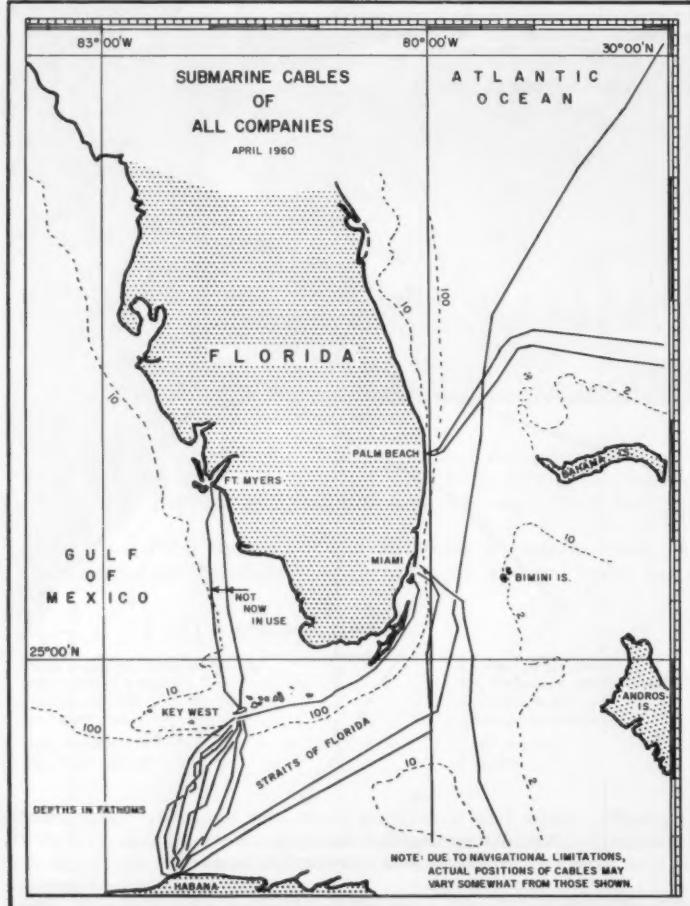


Chart showing the general location of the underseas cables are available from the American Telephone and Telegraph Company, General Manager, Special Projects Area, 32 Ave. of the Americas, New York 13, N. Y.

FLORIDA TELEPHONE CABLE AREA--CAREFUL PLEASE

The chart shows the telephone cables to be found in the waters off Florida. To avoid the loss of valuable tackle, cargo, otter boards, nets, or anchor hooks, fishing vessels are urged to not drag nets or drop anchors or other heavy gear near the cable routes shown on the chart. Avoid starting your trawling runs so that you cross these underseas telephone cables.



Charts showing the general location of the underseas cables are available from the American Telephone and Telegraph Company, General Manager, Special Projects Area, 32 Ave. of the Americas, New York 13, N. Y.

FEDERAL RESEARCHERS TAKE RARE "COW" SHARK

A one-ton fish with the unlikely name of "cow shark" has been landed off the Mississippi Delta by the Fish and Wildlife Service exploratory vessel Oregon, the Department of the Interior reported on January 15, 1963. The catch marks the first time a cow shark has been taken in the Gulf of Mexico, and the first one seen off North America in more than 75 years.

The 13-foot beast was picked up in a shrimp trawl about 40 miles southeast of the mouth of the Mississippi River at a depth of approximately 1,300 feet. Measurements and photographs were taken and these along with the shark's jaws and tail will be placed in the scientific collections at the National Museum in Washington, D. C. The shark's scientific name is Hexanchus griseus.

Most species of shark have five gill clefts on each side but this shark's scientific name Hexanchus literally means six-gilled. The presence of six gill openings on each side and the dissimilarity between its upper and lower teeth are identifying characteristics of this species. They are called cow sharks because they are large, slow moving, and not streamlined.

Cow sharks are known to eat small fish, squid, and other marine animals. They are not classed as maneaters.

The only other record of the occurrence of a cow shark on the east coast of continental North America was in 1886 near Currituck Lighthouse, North Carolina. According to the Fish and Wildlife Service's Bureau of Commercial Fisheries, this species of shark is probably more common than the records indicate, but it is not often seen or captured because it usually inhabits deeper waters.

Little is known about the occurrence and life of the cow shark in western hemisphere waters, and considerable research is needed on this and many other deep-water species that inhabit the Caribbean Sea and Gulf of Mexico.

The new record was an "extra dividend" of exploratory trawls the Oregon has been making to determine if commercial quantities of royal red shrimp can be taken in the Gulf during all seasons of the year. The shrimp exploration thus far indicates that commercial quantities of these deep-water shrimp are present in the fall.



Thirteen-foot cow shark caught by exploratory vessel, Oregon, in the Gulf of Mexico.

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